CA2ON
TR91
-1972
S07A

Ontario tax studies · 7

tax credit analysis models

supplementary material
taxation & fiscal policy branch
ministry of treasury, economics & intergovernmental affairs

Presented to the

LIBRARY *of the*

UNIVERSITY OF TORONTO

by

J. STEFAN DUPRE

ONTARIO TAX STUDIES 7

Supplementary Material

TAX CREDIT ANALYSIS MODELS

October 1972

Taxation and Fiscal Policy Branch
Ministry of Treasury, Economics and
Intergovernmental Affairs
Government of Ontario

LIBRARY
JUL 29 2003
UNIVERSITY OF TORONTO

INTRODUCTION

This document contains the supplementary material to Ontario Tax Study 7, Analysis of Income and Property Taxes in Guelph. It contains the manuals for three computer models:

'Repcred': the representative taxfiler analysis for property and sales tax credits.

'Provcred": the analysis of the revenue and incidence effects of property and sales tax credits in Ontario.

'Guelphcred': the analsyis of the revenue and incidence effects of tax credits in Guelph.

Additional copies are available from the Taxation and Fiscal Policy Branch, Ministry of Treasury, Economics and Intergovernmental Affairs, Ontario.

October 1972

Brian Hull

Digitized by the Internet Archive
in 2024 with funding from
University of Toronto

https://archive.org/details/31761120607114

MANUAL

REPRESENTATIVE TAXFILER ANALYSIS FOR PROPERTY AND SALES TAX CREDITS

"REPCRED"

Brian Hull

March 17, 1972

Taxation and Fiscal Policy Branch
Department of Treasury and Economics
Government of Ontario

TABLE OF CONTENTS

Chapter

I INTRODUCTION

II DESCRIPTION OF PROGRAM

III APPLICATION OF PROGRAM TO ANALYSIS

Appendix

A TABLES GENERATED

A.1 Summary

A.2 Tables

B TAX SYSTEMS ANALYZED

B.1 Possible Forms of the Tax Credit

B.2 Property Tax Exemption

B.3 Sales Tax Credit

B.4 Selection Code for Allowance Formulae

B.5 Fortran Version of Allowance Formulae

C PROGRAM PARAMETERS

C.1 Summary

C.2 Format of Datafile

C.3 Sample Datafiles

D PROGRAM LISTING

I. INTRODUCTION

This program has been designed to examine the implications of various possible forms of tax credit scheme. It is currently restricted to the examination of sales and property tax credits, but could, with a little modification, be used to examine possible credits for medicare payments.

The program provides for the analysis of a number of possible formulations of a property tax credit as well as facilitating an examination of the implications of various possible sets of parameters.

The sales tax credit formula is related uniquely to one form of the property tax credit - the form proposed at the Finance Ministers meeting in Ottawa, November 1-2, 1971.

The program provides for examination of a property tax exemption formula, as well as a formula, similar to the then existing basic shelter grant program.

The primary purpose of this program is to examine and compare the incidence effects of alternative formulae and alternative sets of parameters.

Following the selection of a particular formula and parameter set, it may also be used as a reference for advising individuals of their prospective benefits under the scheme.

II. DESCRIPTION OF PROGRAM.

The program analyzes the incidence effects of alternative tax allowance formulae assuming the application of the new Income Tax Act - Bill C-259.

The rate schedule used is that initially proposed in Bill C-259 for 1972 assuming a combined federal and 30 per cent provincial tax.[1]

The program provides for the optional inclusion in the analysis of the new allowances under Bill C-259: the employment expense allowance; the child care allowance; the new personal exemption levels for singles, marrieds and old people; charitable deductions; the standard $100 deduction; and contributions to registered retirement pension funds.

The program generates a matrix of results by gross income and property tax class. It examines up to 40 income classes and 30 property tax classes. Tables are generated for the following values: total income and property tax payable before tax credit formula is applied; difference in taxes produced by the credit formula (including refunds where applicable); the credit as a per cent of gross income; property tax as a per cent of gross income; total tax as a per cent gross income; and total tax less credit as a per cent gross income.

---

1. See: Hon. E. J. Benson, Summary of 1971 Tax Reform Legislation (Ottawa: Department of Finance, 1971), page 17.

The program analyzes several broad categories of credit formulae: tax credits related solely to income (either taxable income or gross income); credits related solely to actual levels of property tax (such as the existing basic shelter exemption grant); credits related to both property tax and income; and a property tax exemption - which alters the tax base rather than the level of taxes to be paid or refunded.

III. APPLICATION OF PROGRAM TO ANALYSIS.

The primary purpose of this program is to examine the incidence effects of various tax credit formula for representative taxfilers. It examines the incidence for various possible combinations of personal exemptions, deductions and allowances.

The program facilitates the first stage in designing a credit formula. A full analysis requires knowledge of the incidence of property taxes by income classes and a costing of the revenue foregone in the province under various formula.

The computer model was designed using the time sharing computer facilities of Polycom Limited, Toronto which has a General Electric 400 series computer.

Appendix A

TABLES GENERATED

SUMMARY.

A run of the program generates an analysis of the effects of the particular credit formula chosen for income filers with a given set of personal exemptions and deductions. Thus, for a run which assumes an individual files as single with no dependents, the effects of the credit are demonstrated for various combinations of gross income and property tax. Each set of personal exemption and dependency characteristics requires a separate run.

The output of a run is prefaced with a listing of the parameter values of the particular credit form being tested as well as a summary of the assumed filer exemption characteristics.

TABLES.

A.1 Sum of income and property tax payable before credit.

A.2 Difference in taxes after credit: value of credit (may be refundable).

A.3 Difference in taxes as per cent of gross income.

A.4 Property tax as per cent gross income.

A.5 Net property tax as per cent gross income (property tax less total credit).

A.6 Total tax as per cent gross income (total tax is sum of income and property taxes).

A.7 Total tax less credit as per cent gross income.

Appendix B

TAX SYSTEMS ANALYZED

B.1 POSSIBLE FORMS OF THE TAX CREDIT

(i) Income Related Credits

A basic credit reduced by some fraction of either gross or taxable income.

$$\text{CREDIT} = \text{BASIC CREDIT} - a_1 Y$$

where Y may be either gross or taxable income

A rule may be adopted that the basic credit is reduced by some fraction of income only after some minimum level of income has been reached.

(ii) Property Tax Related Credits

a) Similar to current basic shelter exemption:

A basic credit increased by some fraction of the average net assessment of the municipality.

$$\text{CREDIT} = \text{BASIC CREDIT} + a_2 A$$

where A is average net assessment of the municipality

A rule may be adopted that if the calculated credit exceeds the basic credit, then the credit is reduced to equal either the basic credit or one-half the property tax whichever is the greater.

b) Related to personal property tax paid:

A basic credit increased by some fraction of property tax paid.

$$\text{CREDIT} = \text{BASIC CREDIT} + a_3 * \text{PROPERTY}$$

A rule may be adopted that the credit does not exceed some fixed upper level. (It should be possible to ascertain at what gross income the limit will usually become operative).

(iii) Credits Related to Both Property Tax and Income

a) A basic credit increased by some fraction of property tax and reduced by some fraction of either gross or taxable income.

$$\text{CREDIT} = \text{BASIC CREDIT} + a_4 \text{ PROPERTY TAX} - a_5 Y$$

where Y is either gross or net income

A rule may be adopted that there be an upper ceiling on the tax. Or, if gross income is adopted, a_5 may be set such that for average taxes for any income level, the credit works out at no more than the basic credit for that group. Thus, those who pay more than average property taxes in their income group will obtain a proportionately greater tax credit. The floor on the credit would be the basic credit level, or some fraction of it.

b) No basic credit and credit calculated as some fraction of property tax reduced by a factor which is itself variable. The factor is the fraction of property tax already calculated divided by some constant.

$$\text{CREDIT} = a_6 \text{ PROPERTY TAX } (1 - \frac{Y}{\text{Constant}})$$

$$= a_6 \text{ PROPERTY TAX} - \frac{a_6 \text{ PROPERTY TAX}}{\text{CONSTANT}} * Y$$

where Y is either gross or taxable income

c) No basic credit and credit calculated as some fraction of property tax reduced non-linearly by income. (parabolic function).

$$\text{CREDIT} = a_6 \text{ PROPERTY TAX } (1 - \frac{Y}{\text{CONSTANT}})^2$$

$$= a_6 \text{ PROPERTY TAX} - \frac{2 * a_6 \text{ PROPERTY TAX}}{\text{CONSTANT}} * Y^2$$

where Y is either gross or taxable income.

B.2 PROPERTY TAX EXEMPTION

Provision to reduce property tax burdens may, in principle, be done with a special exemption. This, however, reduces the benefits of the scheme for those whose exemptions already approach to exceed their gross income.

B.3 SALES TAX CREDIT

The model will analyze one form of sales tax credit in conjunction with a credit related to both property tax and taxable income.

B.4 SELECTION CODE FOR ALLOWANCE FORMULAE

Credit Systems:

NN = 1

CREDIT = BASIC CREDIT - a_1 (Y - PTP)

where Y = TAXABLE INCOME

PTP = LEVEL OF EXEMPT TAXABLE INCOME (PTP $\geqslant$ 0)

a_1 = INCP

NN = 2

CREDIT = BASIC CREDIT + a_2A

where A = average net property tax of municipality

Set PTP = A

a_2 = CRED

(SEE NOTE)

NN = 3

CREDIT = BASIC CREDIT + a_4 PROPERTY TAX - a_5Y

where Y = TAXABLE INCOME

a_4 = CRED

a_5 = INCP

NN = 4

CREDIT = BASIC CREDIT + a_3 PROPERTY TAX

where a_3 = CRED

(SEE NOTE)

NN = 5

CREDIT = BASIC CREDIT - a_1 (Y - PTP)

where Y = GROSS INCOME (PTP $\geqslant$ 0)

a_1 = INCP

(COMPARE WITH NN = 1)

Exemption System:

NN = 6

EXEMPTION = BASIC EXEMPTION - INCP*Y

where BASIC EXEMPTION = BCRED

GROSS INCOME = Y

Note: When NN = 2, if the calculated credit exceeds one half the property tax, the credit is calculated as one half of property tax.

When NN = 4, if the calculated credit exceeds some upper limit, PTP, it is set equal to the upper limit.

B.5 FORTRAN VERSION OF ALLOWANCE FORMULAE

NN = 1

```
CD(I) = BCRED - INCP*(I) - PTP)
if CD(I).LE.FP*BCRED, CD(I) = FP*BCRED
```

NN = 2

```
CD(J) = BCRED + CRED*PTP
if CD(J).GE..5*PTAX(J), CD(J) = .5*PTAX(J)
```

```
NN = 3

        TTT(I,J) = BCRED + CRED *PTAX(J) - INCP*TTINC(I,J)

NN = 4

        CD(J) = BCRED + CRED*PTAX(J)

        if CD(J).GE.PTP, CD(J) = PTP

NN = 5

        CD(I) = BCRED - INCP*(XINC(I) - PTP)

        if CD(I).LE.FP*BCRED, CD(I) = FP*BCRED

NN = 6

        CD(I) = BCRED - INCP*XINC(I)

        if CD(I).GT.PTP, CD(I) = PTP

           TINC (I) = TINC (I) - CD(I)
```

Note: NN = 6 is the exemption scheme - the exemption is subtracted from taxable income and the rate schedule applied to the resulting net income.

Appendix C

PROGRAM PARAMETERS

C.1 SUMMARY.

The program reads a datafile in the course of each run. This specifics the credit formula, parameters, the filer's exemption characteristics and the set of income and property tax classes to be analyzed.

C.2 FORMAT OF THE DATAFILE.

"Read" Statement No.	Variable Symbol	Description
1	NN	Credit or exemption formula - see Appendix B for specification.
	N1	Child care allowance: 0 if no child care; otherwise 1.
	N2	Sales tax credit: 0 if no sales credit; otherwise 1.
	N3	Registered pension plan deduction: 0 if not analyzed; otherwise 1.
2	M	No. of income classes.
	N	No. of LIA, RTC classes.
	K	0 if single; 1 if married.
	KK	No. of children under 16.
	L	No. of children under 14.
	LL	No. of children 16 or over.
	LLL	0 if filer under 65 years old; otherwise 1.

	MM	Employment expenses: 0 or number claimed.
3	EXE	Maximum employment expenses.
	EXA	Old age $650 deduction.
	EXPI	Single exemption.
	EXP2	Married exemption.
4	DEM	Standard $100 deduction
	DECH	20 per cent charitable deduction.
	EXCH1	Exemption for children under 16.
	EXCH2	Exemption for children over 16.
5	DECAR	Maximum day-care allowance - $2,000.
	DECARL	Assumed level of day care per child.
	DECAM	Fraction of income which may be subtracted for day care.
6	CRED	Credit as % property tax.
	BCRED	Basic property tax credit
	INCP	Income coefficient.
	PTP	Maximum credit permitted.
	FP	Minimum credit allowed.
7	XINC	Income classes.
8	ARSH	Average taxes.
9	RSH	Marginal tax rate.
10	PTAX	Property tax levels.

11	RTC	Refundable tax credit classes.
12	LIA	Low income allowance classes.

Appendix D

PROGRAMME LISTING

D.1 PROGRAMME OUTLINE.

Main Subroutines:	Programme		Calls
	RSCH	-	Rate schedule
	TAB1	-	Tables
	TAB2		
	TAB3		
	TAB4		
	TAB5		

D.2 TABLE DESCRIPTION.

TAB1	-	Property tax exemption tables
TAB2	-	Generates 7 tables by income and property tax class (see Appendix A)
TAB3	-	Assumption summary for run
TAB4	-	Header
TAB5	-	Summary of property classes analyzed.

RPCRD

```
70$SAV
80$NDM
90$TTY,120
100$RPC
110 DIMENSION RTC(40),LIA(40)
120 COMMON XINC(40),TINC(40),CD(40),CCD,RSH(15),ARSH(15)
130 COMMON FN
140 COMMON PTAX(30)
150 COMMON MMM,CRED
160 COMMON N,K,KK,L,LL,LLL,MM,BCRED,INCP,PTP,FP
170 COMMON M,NN,N1,N2
180 COMMON STINC(40,30)
190 COMMON TTT(40,30)
200 COMMON STX(40,30)
210 COMMONTAX(40,30),TTINC(40,30),CC(5)
211 COMMON N3
220C
230C
240C
250C   REPRESENTATIVE TAX FILER ANALYSIS
260C FOR PROPERTY AND SALES TAX  CREDITS
270C
280C
290C  BRIAN HULL,  SEPT.20, 1971
300C
310 REAL LIA,INCP
320 DATA TTINC/1200*0/
330 DATA XINC,TINC,RTC/120*0/
340 DATA STINC,TAX/2400*0/
350 DATA ARSH,RSH/30*0/
360 DATA PTAX/30*0/
370 DATACD/40*0/
380 DATA LIA/40*0/
385 DATA STX/1200*0/
390 DATA CC/5*0/
400 DATA TTT/1200*0/
410 100 FORMAT(A6)
420 PRINT,"DATAFILE",^*
430 READ 100,FN
440 CALL OPENF (1,FN)
450 CALLTAB4
460C
470 READ(1;,ERR=154) LN,NN,N1,N2,N3
480C     N1=0,IF NO CHILD CARE; 1,IF CHILD CARE
490C   N2   = 0,IF NO SALES TAX CRED; 1, IF PER C. S.TAX.CRED.
500C    N.B. SALES TAX CREDIT IS ASSUMED TO BE 10.00 DOLLARS
510C
515C    N3 = 0 IF NO REGISTERED PENSION FUND OTHERWISE 1
520C          NN= 1,CREDIT FUNCTION OF INCOME;3,FUNCTION TAXABLE ;4,
530 READ(1;,ERR=150) LN,M,N,K,KK,L,LL,LLL,MM
```

RPCRD CONTINUED

```
540C          M= NO. OF INCOME CLASSES
550C          N= NO. OF RTC,LIA CLASSES
560C          K= Ø IF SINGLE,1 IF MARRIED
570C         KK= NO. OF CHILDERN UNDER 16
580C          L= NO. OF CHILDREN UNDER 14
590C         LL= NO. OF CHILDREN 16 OR OVER
600C        LLL= Ø IF UNDER 65. OTHERWISE 1
610C         MM= EMPLOYMENT EXPENSE  Ø FOR NONE; OR NO.
620 READ(1;,ERR=150)LN,EXE,EXA,EXP1,EXP2
630C        EXE= EMPLOYMENT EXPENSES
640C        EXA= OLD AGE $650 DEDUCTION
650C        EXP= 1 IF SINGLE DEDUCTION;2 IF MARRIED
660 READ (1;,ERR=150) LN,DEM,DECH,EXCH1,EXCH2
670C        DEM= STANDARD $100 DEDUCTION
680C
690C       DECH= 20 PER CENT CHARITABLE DEDUCTION
700C      EXCH1= CHILDREN UNDER 16
710C      EXCH2= CHILDREN OVER 16
720 READ(1;,ERR=150) LN,DECAR,DECARL,DECAM
730C      DECAR= DAYCARE OF CHILDREN $2000
740C     DECARL= ASSUMED LEVEL PER CHILD
750C      DECAM= FRACTION OF INCOME
760 READ(1;,ERR=150) LN,CRED,BCRED,INCP,PTP,FP
770C       CRED= CRED % PROPERTY TAX
780C      BCRED= BASIC PROPERTY TAX
790C       INCP= INCOME CO-EFFICIENT
800C        PTP= MAX. CREDIT PERMITTED"
810C         FP= FUDGE FACTOR
820 READ(1,)  (XINC(I),I=1,M)
830 READ(1,)  (ARSH(I),I=1,13)
840 READ(1,)  (RSH(I),I=1,13)
850 READ(1,)  (PTAX(I),I=1,30)
860 READ(1,)  (RTC(I),I=1,N)
870 READ(1,)  (LIA(I),I=1,N)
880 700  FORMAT(X,I2,X,F8.2)
890 710 FORMAT (F9.2)
900 PRINT,"CRED ",^*
910 PRINT710,CRED
920 PRINT,"BCRED",^*
930 PRINT 710,BCRED
940 PRINT,"PTP  ",^*
950 PRINT710,PTP
960 PRINT,"INCP ",^*
970 PRINT710,INCP
980 PRINT,
990 GO TO 125
1000 150 WRITE(2,),"ERROR IN DATAFILE",LN
1010 GO TO 111
1020 125 CONTINUE
1030 DO 256 J=1,30
```

RPCRD CONTINUED

```
1040 256 PTAX(J)=PTAX(J)*10.
1050 IF(NN.NE.2)GOTO919
1060 DO918 J=1,25
1070 CD(J)=BCRED+CRED*PTP
1080 IF(CD(J).GE..5*PTAX(J))CD(J)=.5*PTAX(J)
1090 PRINT,"CD  ,PTAX",^*
1100 916 FORMAT(2X,I2,F8.3,X,F8.1)
1110 PRINT 916,J,CD(J),PTAX(J)
1120 918 CONTINUE
1130 919 CONTINUE
1140 IF(NN.NE.4) GO TO769
1150 PRINT,
1160 PRINT,
1170 DO380J=1,25
1180 CD(J)=CRED*PTAX(J)
1190 CD(J)=BCRED+CD(J)
1200  IF(CD(J).GE.PTP)CD(J)=PTP
1210 IF(J.EQ.1)CD(J)=0
1220 PRINT,"CD  ",^*
1230 PRINT709,J,CD(J)
1240 PRINT,"PTAX",^*
1250  PRINT709,J,PTAX(J)
1260 380 CONTINUE
1270 769 CONTINUE
1280C
1290C
1300C
1310 DO255 I=1,M
1320 XINC(I)=XINC(I)*100.
1322 TINC(I)=XINC(I)
1323 255 CONTINUE
1330C
1331 IF(N3.NE.1) GO TO 257
1332 DO 258 I=1,M
1333 RTC(I)=XINC(I)*.06
1334 IF(RTC(I).GE.2500.) RTC(I)=2500.
1335 TINC(I)=XINC(I)-RTC(I)
1336 258 CONTINUE
1337 257 CONTINUE
1340C
1350C
1360  DO 500 I=1,M
1370C
1380C
1390 IF(K.LE.0) GOTO 200
1400 XIE=EXP2
1410 GOTO210
1420 200 CONTINUE
1430 XIE=EXP1
1440 210 CONTINUE
```

RPCRD CONTINUED

```
1450         EXE= XINC(I)*.Ø3
1460       IF(EXE.GE.150.Ø) EXE=150.Ø
1470 TINC(I)=TINC(I)-XIE
1480C  CHILD CARE DEDUCTIONS
1490 IF(N1.EQ.Ø) GOTO211
1500 XP=DECARL*L
1510 IF(XP.GE.DECAM*XINC(I)) XP=DECAM*XINC(I)
1520 IF(XP.GE.DECAR) XP=DECAR
1530 TINC(I)=TINC(I)-XP
1540 211 CONTINUE
1550 TINC(I)=TINC(I)-KK*EXCH1
1560 TINC(I)=TINC(I)-LL*EXCH2
1570 TINC(I)=TINC(I)-LLL*EXA
1580 TINC(I)=TINC(I)-EXE*MM
1590 YY=DECH*XINC(I)
1600 IF(YY.GE.100) GOTO 220
1610 YY=Ø
1620 GOTO230
1630 220 CONTINUE
1640 DEM=Ø
1650 230 CONTINUE
1660 IF(YY.GE.300.Ø)YY=300.Ø
1670 TINC(I)=TINC(I)-DEM-YY
1680 IF(TINC(I).LE.Ø.Ø)TINC(I)=Ø.Ø
1690C
1700C
1710C
1720 IF(NN.NE.5)GOTO410
1730 TTT(I,1)=TINC(I)
1740 TINC(I)=XINC(I)
1750 GOTO427
1760 410 IF(NN.NE.1)GOTO425
1770 427 CONTINUE
1780 IF(TINC(I).LE.PTP)GOTO424
1790 CD(I)=BCRED-INCP*(TINC(I)-PTP)
1800 IF(CD(I).LE.FP*BCRED)CD(I)=FP*BCRED
1810 GOTO426
1820 424 CONTINUE
1830  CD(I)=BCRED
1840 426 CONTINUE
1850 IF(NN.EQ.5)TINC(I)=TTT(I,1)
1860 425 CONTINUE
1870C
1880 IF(NN.NE.6)GOTO250
1890 CD(I)=BCRED-INCP*XINC(I)
1900 IF(CD(I).GT.PTP)CD(I)=PTP
1910 IF(CD(I).LE.Ø.Ø) CD(I)=Ø
1920 GO TO 390
1930C
1940C
```

RPCRD CONTINUED

```
1950 250 CONTINUE
1960C
1970C
1980C
1990C
2000C
2010C
2020C
2030C
2040C
2050C
2060  GOTO 395
2070  390 CONTINUE
2080
2090 TTINC(I,1)=TINC(I)
2100 TTINC(I,1) =TTINC(I,1) -CD(I)
2110  MMM=1
2120  GO TO 396
2130 395 CONTINUE
2140 MMM=30
2150 396 CONTINUE
2160 500 CONTINUE
2170C
2180 DO 252 I=1,M
2190 DO 252 J=1,MMM
2200 TTT(I,J)=TTINC(I,J)
2210 TTINC(I,J)=TINC(I)
2220 252 CONTINUE
2230C
2240C
2250C
2260 CALLRSCH
2270C
2280C
2290C
2300C
2310 IF(NN.NE.3)  GOTO1748
2320  XYZ=0
2330  IF(N2.EQ.0) GOTO2109
2340 XYZ=10.*KK
2350 XYZ=XYZ+10.*LL
2360 IF(K.EQ.0) KS=1
2370 IF(K.NE.0) KS=2
2380 XYZ=XYZ +KS*10.0
2390 2109 CONTINUE
2400 DO1745 I=1,M
2410 DO1746 J=1,30
2420 TTT(I,J)=0
2430 STX(I,J)=XYZ-.01*TTINC(I,J)
2440 IF(STX(I,J).LE.0) STX(I,J)= 0
```

RPCRD CONTINUED

```
2450 TTT(I,J)=BCRED+CRED*PTAX(J)-INCP*TTINC(I,J)
2460 IF(TTT(I,J).LE.Ø) TTT(I,J)=Ø
2470 IF(TTT(I,J).GT.PTP) TTT(I,J)=PTP
2480 TTT(I,1)=Ø
2490 2147 TTT(I,J)=TTT(I,J)+STX(I,J)
2500 STINC(I,J)=TTT(I,J)
2510 IF(J.EQ.1) TTT(I,1)=Ø
2520 1746 CONTINUE
2530 1745 CONTINUE
2540 1748 CONTINUE
2550 IF(NN.EQ.5)GOTO1776
2560 IF(NN.EQ.1)GOTO1776
2570 GOTO1810
2580 1776 CONTINUE
2590C
2600 DO 122 I=1,M
2610 DO 122 J=1,MMM
2620 STINC(I,J)=CD(I)
2630 122 CONTINUE
2640 1810 CONTINUE
2650 IF(NN.EQ.4)GOTO1931
2660 IF(NN.EQ.2)GOTO1931
2670 GOTO1939
2680 1931 CONTINUE
2690 DO 1938 I=1,M
2700 DO 1937 J=1,MMM
2710 STINC(I,J)=CD(J)
2720 1937 CONTINUE
2730 1938 CONTINUE
2740 1939 CONTINUE
2750C
2760C
2770C
2780C
2790C
2800C
2810C
2820C
2830C
2840C
2850 IF(MMM.GT.1.Ø) GO TO 3Ø1Ø
2860 CALLTAB3
2870 CALLTAB1
2880 GO TO 3Ø2Ø
2890 3Ø1Ø CONTINUE
2900 CALLTAB3
2910 CALLTAB2
2920 3Ø2Ø CONTINUE
2930 CALLTAB5
2940 111 CONTINUE
```

RPCRD CONTINUED

```
2950 PRINT,
2960 PRINT,
2970 2 FORMAT(A6)
2980 PRINT,"TYPE NAME OUTPUT",^*
2990 READ2,FNAM
3000 CALL CLOSEF(2,FNAM)
3010 STOP
3020 END
3030C
3040C
3050C
3060C
3070C
3080C
3090C
3100C
3110 SUBROUTINETAB1
3120 WRITE(2,),
3130 WRITE(2,),
3140  WRITE(2,),"   GROSS                                    TAX %      TAX %"
3150  WRITE(2,),"   INCOME     TAXABLE    TAX              INCOME:    INCOME:"
3160  WRITE(2,),"   CLASS      INCOME     CREDIT           OLD        NEW"
3170  WRITE(2,),"   -------    -------    -------          -------    -------"
3180 5000 FORMAT (2X,F8.1,4(2X,F8.1))
3190  DO 5010 I=1,M
3200 J=1
3210 TAX(I,J)=TAX(I,J)/XINC(I)*100.0
3220 STINC(I,J)=STINC(I,J)/XINC(I)*100.0
3230 WRITE(2,5000),XINC(I),TINC(I),CD(I),STINC(I,J),TAX(I,J)
3240  5010 CONTINUE
3250  WRITE(2,),"   N.B.  TAXABLE INCOME IS BEFORE CREDIT"
3260  WRITE(2,), "         IS DEDUCTED. TAX CALCULATED AFTER"
3270  WRITE(2,), "         CREDIT IS DEDUCTED."
3280  RETURN
3290 END
3300C
3310C
3320C
3330C
3340C
3350C
3360C
3370 SUBROUTINETAB2
3380 6060 FORMAT(10X,10(8X,I2))
3390 6070 FORMAT(2X,F8.1,10(2X,F8.1))
3400 6080FORMAT(/////)
3410 6090FORMAT(1(3X,7H-------))
3420C
3430C
3440C
```

RPCRD CONTINUED

```
3450C
3460C
3470 DO6500 IB=1,7
3480 IF(IB.LE.1) GO TO 6001
3490 IF(IB.LE.2) GO TO 6002
3500 IF(IB.LE.3) GO TO 6003
3510 IF(IB.LE.4) GO TO 6004
3520 IF(IB.LE.5) GO TO6005
3530 IF(IB.LE.6)GOTO6006
3540  IF(IB.LE.7) GOTO6007
3550 6001 CONTINUE
3560 WRITE(2,),
3570 WRITE(2,6080)
3580 ENDFILE2
3590 WRITE(2,),"TAX PAYABLE"
3600 WRITE(2,),"=== ========"
3610 WRITE(2,)
3620 WRITE(2,),"INCOME PLUS PROPERTY TAX  PAYABLE"
3630 WRITE(2,)," (BEFORE CREDIT)"
3640 GO TO 6050
3650 6002 CONTINUE
3660 WRITE(2,),
3670 WRITE(2,6080)
3680 ENDFILE2
3690 WRITE(2,),"  DIFFERENCE IN TAXES"
3700 WRITE(2,),"  ==================="
3710 GO TO 6050
3720 6003 CONTINUE
3730 WRITE(2,),
3740 WRITE(2,6080)
3750 ENDFILE2
3760 WRITE(2,),"DIFFERENCE IN TAX AS % GROSS INCOME"
3770 WRITE(2,),"================================="
3780 GO TO 6050
3790 6004 CONTINUE
3800 WRITE(2,6080)
3810 ENDFILE2
3820 WRITE(2,),"PROPERTY TAX AS A % GROSS INCOME"
3830 WRITE(2,),"================================="
3840 GO TO 6050
3850 6005 CONTINUE
3860 WRITE(2,6080)
3870 ENDFILE2
3880 WRITE(2,),"NET PROPERTY TAX AS %  GROSS INCOME"
3890 WRITE(2,),"================================="
3900 GOTO6050
3910 6006 CONTINUE
3920 WRITE(2,6080)
3930 ENDFILE2
3940 WRITE(2,),"TOTAL TAX AS % GROSS INCOME"
```

RPORD CONTINUED

```
3950 WRITE(2,),"============================="
3960 GOTO6050
3970 6407 CONTINUE
3980 WRITE(2,6080)
3990 ENDFILE2
4000 WRITE(2,),"TOTAL TAX LESS CREDIT AS % GROSS INCOME"
4010 WRITE(2,),"======================================="
4020 6050 CONTINUE
4030 IX=0
4040 IP=0
4050 WRITE(2,),
4060 WRITE(2,),
4070C
4080 DO 6400 IJ=1,3
4090 CO(IJ)=0
4100 IX=IX+1
4110 IY=1+IP
4120 IP=10*IX
4130 IF(IP.GT.30) IP=30
4140 IK=IY
4150 WRITE(2,),
4160 WRITE(2,),"   GROSS"
4170 WRITE(2,),"   INCOME"
4180 WRITE(2,),"   CLASS            PROPERTY TAX CLASS"
4190 WRITE(2,6060),(JP,JP=IK,IP)
4191 X=0
4195 WRITE(2,6070),X,(PTAX(JP),JP=IK,IP)
4200 WRITE(2,6090)
4210 IF(IB.LE.1) GO TO 6011
4220 IF(IB.LE.2) GO TO 6012
4230 IF(IB.LE.3) GO TO 6013
4240 IF(IB.LE.4) GO TO 6014
4250 IF(IB.LE.5) GOTO6015
4260 IF(IB.LE.6)GOTO6016
4270 IF(IB.LE.7)GOTO6017
4280 6011 CONTINUE
4290 DO 6666 I=1,M
4300 DO6667 JP=IK,IP
4320 6667 TTINC(I,JP)=TTINC(I,JP)+PTAX(JP)
4330 6666 WRITE(2,6070),XINC(I),(TTINC(I,JP),JP=IK,IP)
4340 GO TO 6400
4350 6012 CONTINUE
4360 DO 6300 I=1,M
4370 WRITE(2,6070),XINC(I),(STINC(I,JP),JP=IK,IP)
4380 6300 CONTINUE
4390 GO TO 6306
4400 6013 CONTINUE
4410 DO 6302 I=1,M
4420 DO 7001 JP=IK,IP
4430 7001 TTT(I,JP)=STINC(I,JP)/XINC(I)*100.
```

RPCRD CONTINUED

```
4440 WRITE(2,6070),XINC(I),(TTT(I,JP),JP=IK,IP)
4450 6302 CONTINUE
4460 GO TO6400
4470 6014 CONTINUE
4480 DO 6304 I=1,M
4490 DO 7002 JP=IK,IP
4500 7002 TTINC(I,JP)=PTAX(JP)/XINC(I)*100.
4510 WRITE(2,6070),XINC(I),(TTINC(I,JP),JP=IK,IP)
4520 6304 CONTINUE
4530 GO TO6400
4540 6015 CONTINUE
4550 DO 6310 I=1,M
4560 DO 7003 JP=IK,IP
4570 7003 TTINC(I,JP)=(PTAX(JP)-STINC(I,JP))/XINC(I)*100.
4580 WRITE(2,6070),XINC(I),(TTINC(I,JP),JP=IK,IP)
4590 6310 CONTINUE
4600 GOTO6400
4610 6016CONTINUE
4620 DO 7555 I=1,M
4630 DO 7556 JP=IK,IP
4640 7556 TTINC(I,JP)=TAX(I,JP)/XINC(I)*100.0
4650 WRITE(2,6070),XINC(I),(TTINC(I,JP),JP=IK,IP)
4660 7555 CONTINUE
4670 GOTO6400
4680 6017 CONTINUE
4690 DO7602 I=1,M
4700 DO7601 JP=IK,IP
4710 7601 TAX(I,JP)=(TAX(I,JP)-STINC(I,JP))/XINC(I)*100.0
4720 WRITE(2,6070),XINC(I),(TAX(I,JP),JP=IK,IP)
4730 7602 CONTINUE
4740 6306 CONTINUE
4750 6400 CONTINUE
4760 6500 CONTINUE
4770 RETURN
4780 END
4790C
4800C
4810C
4820C
4830C
4840C
4850 SUBROUTINERSCH
4860C RATE SCHEDULE CALCULATIONS
4870 DO 3005 I=1,M
4880 DO 3005 J=1,MMM
4890 IF(TTINC(I,J).GE.0) GO TO 2800
4900 TTINC(I,J)=0
4910 GOTO3000
4920 2800 CONTINUE
4930 IF(TTINC(I,J).GE.500.0) GO TO 2810
```

RPCRD CONTINUED

```
4940 TAX(I,J)=TTINC(I,J)*RSH(1)
4950 GO TO 3000
4960 2810 CONTINUE
4970 IF(TTINC(I,J).GE.1000.0) GO TO 2820
4980 TAX(I,J)=(TTINC(I,J)-500.0)*RSH(2)
4990 TAX(I,J)=TAX(I,J)+ARSH(2)
5000 GO TO 3000
5010 2820 CONTINUE
5020 IF(TTINC(I,J).GE.2000.0) GO TO 2830
5030 TAX(I,J)=(TTINC(I,J)-1000.0)*RSH(3)
5040 TAX(I,J)=TAX(I,J)+ARSH(3)
5050 GOTO3000
5060 2830 CONTINUE
5070 IF(TTINC(I,J).GE.3000.0) GO TO 2840
5080 TAX(I,J) =(TTINC(I,J)-2000.0)*RSH(4)
5090 TAX(I,J) =TAX(I,J)+ARSH(4)
5100 GO TO 3000
5110 2840 CONTINUE
5120 IF(TTINC(I,J).GE.5000.0) GO TO 2850
5130 TAX(I,J) =(TTINC(I,J)-3000.0)*RSH(5)
5140 TAX(I,J) =TAX(I,J)+ARSH(5)
5150 GO TO 3000
5160 2850 CONTINUE
5170 IF(TTINC(I,J).GE.7000.0) GO TO 2860
5180 TAX(I,J) =(TTINC(I,J)-5000.0)*RSH(6)
5190 TAX(I,J) =TAX(I,J)+ARSH(6)
5200 GO TO 3000
5210 2860 CONTINUE
5220 IF(TTINC(I,J).GE.9000.0) GO TO 2870
5230 TAX(I,J) =(TTINC(I,J)-7000.0)*RSH(7)
5240 TAX(I,J) =TAX(I,J)+ARSH(7)
5250 GOTO3000
5260 2870 CONTINUE
5270 IF(TTINC(I,J).GE.11000.0) GO TO 2880
5280 TAX(I,J) =(TTINC(I,J)-9000.0)*RSH(8)
5290 TAX(I,J) =TAX(I,J)+ARSH(8)
5300 GO TO 3000
5310 2880 CONTINUE
5320 IF(TTINC(I,J).GE.14000.0) GO TO 2890
5330 TAX(I,J) =(TTINC(I,J)-11000.0)*RSH(9)
5340 TAX(I,J) =TAX(I,J)+ARSH(9)
5350 GO TO 3000
5360 2890 CONTINUE
5370 IF(TTINC(I,J).GE.24000.0) GO TO 2892
5380 TAX(I,J) =(TTINC(I,J)-14000.0)*RSH(10)
5390 TAX(I,J) =TAX(I,J) +ARSH(10)
5400 GO TO 3000
5410 2892 CONTINUE
5420 IF(TTINC(I,J).GE.39000.0) GO TO 2894
5430 TAX(I,J) =(TTINC(I,J)-24000.0)*RSH(11)
```

RPCRD CONTINUED

```
5440 TAX(I,J) =TAX(I,J)+ARSH(11)
5450 GO TO 3000
5460 2894 CONTINUE
5470 IF(TTINC(I,J).GE.60000.0) GO TO 2896
5480 TAX(I,J) =(TTINC(I,J)-39000.0)*RSH(12)
5490 TAX(I,J) =TAX(I,J)+ARSH(12)
5500 GO TO 3000
5510 2896 CONTINUE
5520 TAX(I,J) =(TTINC(I,J)-60000.0)*RSH(13)
5530 TAX(I,J) =TAX(I,J)+ARSH(13)
5540 3000 CONTINUE
5550 IF(TAX(I,J).LE.0.0)TAX(I,J)=0.0
5560 3005 CONTINUE
5570 RETURN
5580 END
5590 SUBROUTINE TAB3
5600 WRITE(2,),
5610 WRITE(2,),
5620 WRITE(2,),"BASIC ASSUMPTIONS OF THIS RUN"
5630 WRITE(2,),"-----","-----","-----","-----","-----","-----"
5640 WRITE(2,),
5650 WRITE(2,),
5660 IF(K.LE.0) WRITE(2,),"SINGLE PERSON"
5670 IF(K.GT.0)WRITE(2,),"MARRIED COUPLE"
5680C
5690C
5700 IF(K.LE.0) GO TO 4080
5710 WRITE(2,),"CHILDREN UNDER 16      ",KK
5720 WRITE(2,),"CHILDREN UNDER 14      ",L
5730 WRITE(2,),"CHILDREN 16 AND OVER   ",LL
5740 4080 CONTINUE
5750 IF(LLL.GE.1) WRITE(2,),"QUALIFIES FOR OLD AGE EXEMPTION"
5760 IF(MM.GE.1) WRITE(2,),"HAS EMPLOYMENT EXPENSE DEDUCTION"
5770 WRITE(2,),"NO. OF INCOME CLASSES  ",M
5780 WRITE(2,),"NO. OF LIA,RTC CLASSES ",N
5790 WRITE(2,),
5800 WRITE(2,),
5810 WRITE(2,),"NATURE OF PROPERTY TAX CREDIT"
5820 WRITE(2,),"======","======","======","======","======","======"
5830 4196 FORMAT(5X,F8.3)
5840 WRITE(2,),"BASIC CREDIT"
5850 WRITE(2,4196),BCRED
5860 WRITE(2,),"FRACTION OFINCOME BY WHICH CREDIT REDUCED"
5870 WRITE(2,4196),INCP
5880 WRITE(2,),"FRACTION OF PROPERTY TAX BY WHICH CREDIT INCREASED"
5890 WRITE(2,4196),CRED
5900 IF(FP.NE.1.)WRITE(2,),"ADJUSTMENT FACTOR IS"
5910 IF(FP.NE.1.)WRITE(2,4196),FP
5920 WRITE(2,),"MAXIMUM CREDIT IS"
5930 WRITE(2,4196),PTP
```

RPCRD CONTINUED

```
5940 IF(N2.LE.0)GOTO5499
5950 WRITE(2,),"SALES TAX CREDIT IS $10. DOLLARS PER CAPITA"
5960 WRITE(2,),
5980 5499 CONTINUE
5985 IF(N3.NE.0)WRITE(2,),"REGISTERED PENSION FUND CONTRIBUTION DEDUCTED"
5986 IF(N3.NE.0)WRITE(2,),"   DEDUCTION 6% INCOME UP TO $2500"
5990 RETURN
6000 END
6010 SUBROUTINETAB4
6020 WRITE(2,),
6030 WRITE(2,),
6040 WRITE(2,),"   REPRESENTATIVE TAX FILER ANALYSIS"
6050 WRITE(2,),"    FOR PROPERTY TAX CREDIT"
6060 311 FORMAT(3X,A6)
6070 WRITE(2,),
6080 WRITE(2,),
6090 WRITE(2,),"DATAFILE CODE"
6100 WRITE(2,311),FN
6110 RETURN
6120 END
6130 SUBROUTINETAB5
6140 ENDFILE2
6150 5020 FORMAT(10X,10(8X,I2))
6160 5025 FORMAT(10X,10(2X,F8.1))
6170 IX=0
6180 IP=0
6190 DO5030 IJ=1,3
6200 CC(IJ)=0
6210 IX=IX+1
6220 IY=1+IP
6230 IP=10*IX
6240 IF(IP.GT.20)IP=30
6250 IK=IY
6260 WRITE(2,)
6270 WRITE(2,),"PROPERTY CLASSES"
6280 WRITE(2,5020),(JP,JP=IK,IP)
6290 WRITE(2,)
6300 WRITE(2,),"INITIAL PROPERTY TAX"
6310 WRITE(2,5025),(PTAX(JP),JP=IK,IP)
6320 WRITE(2,)
6330 WRITE(2,)
6340  WRITE(2,)
6350 5122 CONTINUE
6360 5030 CONTINUE
6370 RETURN
6380 END
```

MANUAL

ANALYSIS OF THE REVENUE AND INCIDENCE EFFECTS OF PROPERTY AND SALES TAX CREDITS IN ONTARIO

"PROVCRED"

Brian Hull
May 11, 1972

Taxation and Fiscal Policy Branch

Ministry of Treasury, Economics
and Intergovernmental Affairs

Government of Ontario

TABLE OF CONTENTS

Chapter

I INTRODUCTION

II DESCRIPTION OF PROGRAM

III APPLICATION OF PROGRAM TO ANALYSIS

Appendix

A TABLES GENERATED

A.1 Summary

A.2 Tables

B TAX SYSTEMS ANALYZED

B.1 Summary

B.2 New Tax Act

B.3 Household Population

B.4 Property Taxes

C PROGRAM PARAMETERS

C.1 Variables

C.2 Format of Datafile

C.3 Classification of Data

D DATA BASE

D.1 Sources

D.2 Listings of Data Base

E PROGRAM LISTING

I INTRODUCTION

This program is designed to examine the revenue and incidence effects of possible sales and property tax credit formulae in Ontario. The analysis may be conducted within three economic frameworks and under two tax systems. The alternative economic frameworks are: the year of the data base (1968); and, 1972 and 1973, assuming plausible economic environments. The alternative tax systems are: the tax system which existed up to December 31, 1971, and, the new tax system introduced by Bill C-259 taking effect January 1, 1972.

The program yields estimates of the total cost of specified credit formulae under the assumed economic environment and tax system as well as an analysis of the cost and incidence of the formulae by gross income and family dependency classes.

The incidence of property taxes by income class is derived from the analysis of Guelph income and property tax records. The Guelph results are normalized to the provincial level.[1]

---

1. See: Brian Hull, GUELPHCRED: Manual for the Analysis of the Revenue and Incidence Effects of Tax Credits in Guelph (Toronto: Ministry of Treasury, Economics and Intergovernmental Affairs, 1972), mimeo; and, Staff Study, Analysis of Income and Property Taxes in Guelph, (Toronto: Ministry of Treasury, Economics and Intergovernmental Affairs, 1972).

II DESCRIPTION OF PROGRAM

The specification of the tax system analyzed and the economic environment is done within the body of the program using switches. The credit system employed must be specified with the appropriate function at the point in the program where the analysis of the credit takes place.

The sales tax credit is a function of the number of members of the household and taxable income.[1] Tax returns filed claiming a married exemption are assumed to correspond to a unique household. However, in households where both spouses work and each earns more than $1,600 (under the new tax act), both file as single. In addition, students with temporary membership in the work force who continue to live at home are still members of their parental household. (The exceptions are students who either alone or in groups may rent accommodation apart from official school residences. Such groups, occupying separately assessed residential units, would be classified as households.) Thus, the proportion of single taxfilers who constitute unique households is very substantially less than the proportion of married ones.

---

1. See: Hon. W. Darcy McKeough, "Preliminary Outline of a System of Property and Sales Tax Credits for Ontario Taxpayers," Meeting of Ministers of Finance, Ottawa, November 1-2, 1971 (Toronto: Department of Treasury and Economics), mimeo.

As the sales tax credit depends upon size of household, and as the proportion of households among filers who file as married is nearly one - while the proportion among those who file as single is much less than one - a classification of tax returns by personal exemption class as well as by gross income class, is required.

In the "Green Book", Taxation Statistics, this information is provided only on a Canada basis. It is thus necessary to employ adjustment factors to reduce the Canada data to a provincial basis. This is done within the program both for numbers of taxfilers and taxable income.

The estimated number of returns and amount of taxable income in each personal exemption class is summed up and adjusted by a factor which brings the total to the known Ontario total in the base year. The number of returns and taxable income are projected to 1972 and 1973 by factors whose derivation is discussed in Appendix B.1.

Two methods are used for deriving taxable income under the new tax act, Bill C-259. The first allows only for the change in personal exemptions. The second employs the average change in the tax base by income tax class, as indicated by the GITAN analysis conducted within a similar economic framework. The procedure is discussed more fully in Appendix B.2.[1]

---

1. Ontario Studies in Taxation Nos. 1, 2 and 4 employ the GITAN program as modified and developed by the Ontario Treasury.

III APPLICATION OF PROGRAM TO ANALYSIS

The principal purpose of this program is to provide a guide to the revenue implications of alternative formulae. The estimates of the model must be accepted within fairly broad confidence intervals. The extrapolation procedure is much more rudimentary than that employed in Ontario Studies in Tax Reform, No. 4. The exact number of households is difficult to estimate. From the total of residential properties assessed for taxation, must be subtracted summer cottages and vacation homes, residences whose occupants file an income tax return in some other jurisdiction, and vacant lots. An estimate of the number of roomers and boarders now eligible must be added.

Appendix A

TABLES GENERATED

SUMMARY.

A run of this program analyzes the revenue and incidence effects of the proposed credit formula for various target years. The data base for runs to date of issue of this manual is 1968. The data is from the Taxation Green Book and is classified by gross income and dependency filing characteristics for each taxfiler.[1] These tables are on a Canada basis and are adjusted to an Ontario basis using the ratio of taxfilers and taxable income by income class for Ontario and Canada.

Property taxes for each income class are derived from the Guelph analysis of matched income tax and property tax records. The property tax figures are the average level for each income class adjusted for the ratio of average provincial property taxes to average Guelph property taxes.

The advantage of the particular grouping of the data employed is that it makes explicit the degree to which family circumstances (number of dependents) affect the value of the credit for taxfilers assumed to be bearing the same level of property taxes. It also a necessary grouping for calculating

---

1. Table 7A, All returns by marital status, dependents and income Taxation Statistics (Ottawa: Department of National Revenue, Taxation, edition 1970) p.104 and following.

the value and incidence of a sales tax credit assumed to be $10 for each member of a family, reduced by 1 per cent of taxable income.

TABLES.

A.1 Adjustment factor, taxfilers, Canada level to Ontario level.

A.2 Number of taxfilers by marital status and number of dependents, Canada.

A.3 Summary by income class, number of taxfilers with taxable returns, Ontario; number of taxfilers, all returns, Ontario; number of taxfilers, all returns, target year of analysis, Ontario.

A.4 Adjustment factor, taxable income, Canada level to Ontario level.

A.5 Taxable income, Total by dependency class, Canada (vertical sum).

A.6 Taxable income, Canada.

A.7 Taxable income, Ontario, old tax act.

A.8 Taxable income, Ontario, new tax act (changes in exemptions method).

A.9 Taxable income, Ontario, new tax act (changes in tax base by income class method using GITAN results).

A.10 Total sales tax credit by income and dependency classes.

A.11 Average value of sales tax credit by income and dependency classes.

A.12 Total revenue cost of sales tax credit.

A.13 Number of households by gross income class.

A.14 Number of households by dependency class.

A.15 Number of taxfilers by dependency class.

A.16 Total number of taxfilers.

A.17 Total number of households.

A.18 Property tax, average per household, by income class.

A.19 Cost of property tax credit by income and dependency classes.

A.20 Cost of property tax credit by income class.

A.21 Cost of property tax credit by dependency class.

A.22 Total cost of property tax credit.

A.23 Average cost of property tax credit by income and dependency classes.

Appendix B

TAX SYSTEMS ANALYZED

B.1 SUMMARY

The provincial credit analyzer estimates the cost and incidence of various possible credit formulae using 1968 data.

The analysis may be conducted for 1968, 1972 and 1973 under both the old tax act and the act adopted in December 1971, C-259.

The modification of the tax base to represent the base under Bill C-259 may be done by either of two procedures:

1. reducing the tax base by the increase in exemptions for singles and marrieds only.

2. altering the tax base by the percentage difference in the tax base under the old and new tax systems (by income class) as indicated by provincial runs of GITAN within the same economic environment.

The total cost of both a sales tax credit and a property tax credit formula is very nearly the same, whichever procedure is used.

The extrapolation of the analysis from the 1968 data base is undertaken with the very simplest possible procedure. The number of taxfilers between 1968 and 1972 increases at the

level projected for Ontario in the GITAN analysis. The number of taxfilers in each income, dependency class cell is increased by this factor. Between 1968 and 1972 the number of taxfilers in Ontario is estimated to increase by slightly more than the national average.

Income in Ontario is assumed to change between 1968 and 1972 by a factor which adopts the forecast performance of the Ontario economy in 1972.[1] Taxable income in Ontario increases more rapidly than income itself and this is allowed for in the analysis.

	1972/1968
Increase in total income	1.44717
Increase in no. of taxfilers	1.18893
Ratio of taxable income to total accured income:[2]	
1968 Old tax base	.5011
New tax base	.4104
1972 Old tax base	.5747
New tax base	.5014

Taxable income for 1972 is then multiplied by a factor which is the increase in total income times the increased share of taxable income (1.44717* ((.5014/.4104)) = 1.76805).

---

1. Canadian and Ontario Economic Forecast (Toronto: Dept. of Treasury and Economics, Fall, 1971).

2. These ratios are based on GITAN runs for 1968, 1972 CANADA basis. That is GITAN, Level 7.2 runs 1968, 7:409; 1972, 7:420. This GITAN analysis is based on the same forecast as that used in this study.

The extrapolation procedure for the economic environment used in this analysis is the same as that used in the Guelph Analyzer.

Property taxes by income class are the average by income class for Guelph in 1968, normalized to the provincial level. See B.4 for a discussion of property tax level extrapolation.

B.2 NEW TAX ACT.

Two methods are used to estimate the tax base under C-259: 1, the change in exemption procedure; 2, the GITAN procedure.

1. Under the exemption procedure, the tax base is reduced by the increase in exemptions for singles and married taxfilers. Taxable income for taxfilers filing as single is reduced by the increase in the single exemption times the number of taxfilers filing as single. Taxable income for taxfilers filing as married is reduced by the increase in the married exemption times the number of taxfilers.

2. With the GITAN method, the taxable income by income class is multiplied by the ratio of taxable income under the new and old systems for the appropriate year.

Gross Income Class	Ratio of New Tax Base to Old	
	1968	1972
$ 0 - 2,000	2.687	7.309
2,000 - 3,000	.395	.568
3,000 - 4,000	.649	.697
4,000 - 5,000	.731	.791
5,000 - 6,000	.793	.833
6,000 - 8,000	.854	.889
8,000 - 10,000	.892	.922
10,000 - 25,000	.963	.953
25,000 and over	1.067	1.0626

Source: GITAN runs 7:409 and 7:20, Ontario. Note in 1968 and 1972 taxable income under $2,000 is an increase in a negative amount.

Factors for GITAN method used in program income classes:

Gross Income Class	Ratio of New Tax Base to Old	
	1968	1972
$ 0 - 2,500	0	0
2,500 - 3,000	.395	.568
3,000 - 3,500	.649	.697
3,500 - 4,000	.649	.697
4,000 - 4,500	.731	.791
4,500 - 5,000	.731	.791
5,000 - 5,500	.793	.833
5,500 - 6,000	.793	.833
6,000 - 6,500	.854	.889
6,500 - 7,000	.854	.889
7,000 - 7,500	.854	.922
7,500 - 8,000	.854	.922
8,000 - 8,500	.892	.953
8,500 - 9,000	.892	.953
9,000 - 9,500	.892	.953
9,500 - 10,000	.892	.953
10,000 - 25,000	.963	1.063
25,000 and over	1.067	1.572

The changed exemption method analyzes only one of the significant differences between the old and new tax acts. It does represent, however, the biggest modification in the tax base. The changes in the tax base produced by the GITAN method is the net effect of all the alterations in the tax base produced by the new tax act.

Thus, the GITAN method includes the net effect of the following alterations:

1. changed exemptions for singles and marrieds.
2. dividend tax credit.
3. standard employment expense allowance.
4. top employee benefits.
5. deductibility of U.I.C. contributions.
6. attribution to employees of employer medicare contributions.
7. taxation of U.I.C. benefits.
8. sickness and accident benefits from private plans.
9. inclusion of scholarship and fellowship income and special student allowance.
10. changed definition of medical expenses.

These factors do not include the effects of the capital gains tax.

B.3 HOUSEHOLD POPULATION.

In 1968, there were 3.366 million tax returns filed in Ontario, of which .522 million constituted untaxable returns.[1] For that year, the Ontario Department of Municipal Affairs reports that there were 2.173 million households assessed for residential and farm taxes.[2] A household for tax purposes must be distinguished from a more behaviourally defined, socio-economic household. More than one "family" may share living quarters assessed as a separate unit, and, a "family" may have more than one dwelling, ski chalet, cottage, etc., each of which is separately assessed as a household for tax purposes. In addition, many vacant lots, zoned for residential housing, are counted as separately assessable units and counted as "households".

	1968	1972
Number of tax returns	3.345 m.	3.977 m.
Number of households	2.173 m.	
Number of households in analysis	2.172 m.	2.583 m.

Number of Households
for Residential and Farm Tax Purposes.

	million
1968	2.172
1969	2.236
1970	2.400 [3]

1. See Taxation Statistics, (Ottawa: Dept. of National Revenue, Taxation, 1970 edition), Table 1, p.15.

2. Hon. W. Darcy McKeough, 1968 Summary of Financial Reports of Municipalities, (Toronto: Dept. of Municipal Affairs, 1969).

3. Hon. W. Darcy McKeough, Summary of Financial Reports of Municipalities, op.cit., 1968 and 1969 editions, and Department of Municipal Affairs.

The actual number of principal householders expected under the tax credit must be the total reduced by the number of second establishments in the Province (primarily cottages) and increased by the anticipated increase in claims from roomers and boarders and tenants. Both of these factors are, to some extent, judgmental and estimated from other sources. An allowance for them should be made after the other analysis is completed.

The analysis implies a 3.75 per cent increase in the household population in 1971 and 1972. This compares with an increase of 2.95 per cent between 1968 and 1969, and of 7.33 per cent between 1969 and 1970.

For purposes of estimating the cost of the sales tax credit the full taxfiling population is used. To estimate the revenue cost of the property tax credit, only the household population, as defined above, is used. The derivation of the household population from the taxfiling population is explained below.

The analysis assumes that all tax returns filed with a married tax exemption constitute a household for purposes of the property tax credit. It further assumes that 95 per cent of those who file as single and claim at least one dependent constitute a household for purposes of the credit. The population of those who file as single with no dependents is reduced by the following factors:

Adjustment Factors From
Taxfiler to Household Basis
for Taxfilers Filing
as Single with No Dependents.

Gross Income Class	
0 - 2,500	.1710
2,500 - 3,000	.2281
3,000 - 3,500	.2851
3,500 - 4,000	.3421
4,000 - 4,500	.4561
4,500 - 5,000	.5416
5,000 - 5,500	.6300
5,500 - 6,000	.6300
6,000 - 6,500	.6300
6,500 - 7,000	.6300
7,000 - 7,500	.6300
7,500 - 8,000	.6300
8,000 - 8,500	.6300
8,500 - 9,000	.6300
9,000 - 9,500	.6300
9,500 - 10,000	.6300
10,000 - 25,000	.6300
25,000 and over	.6300

B.4 PROPERTY TAXES.

Property tax by income class is the average by income class for Guelph in 1968, normalized to the Provincial level.

Extrapolation of property taxes:

Guelph mill rates:

1968	27.70
1969	28.90
1970	32.97
1971	30.60

increase 71/68 1.1102

implicit annual rate of change 72/68 2.65 per cent.

AVERAGE PROPERTY TAX
1968

Ontario	$337.00
Guelph	$326.00
Guelph analysis	$320.00

Appendix C

PROGRAM PARAMETERS

C.1 VARIABLES.

XTRO(20)	=	No. of taxfilers with taxable returns, ONTARIO.
TINCO(20)	=	Total income, ONTARIO
TBLO(20)	=	Taxable income, ONTARIO
TXO(20)	=	Total tax, ONTARIO
XNTR(20)	=	Number of tax returns, CANADA
XARO(20)	=	Total taxfilers, all returns, ONTARIO
VABLO(20)	=	Total taxable income, all returns, ONTARIO
TAX(20)	=	Total tax, all returns, CANADA
D(20, 8)	=	No. of tax returns, CANADA, in each personal exemption class
TT(20, 8)	=	Taxable income, for each personal exemption class, CANADA
PNTR(20)	=	Ratio, all ONTARIO taxfilers, to all CANADIAN taxfilers
ATO(20)	=	Not used
STT(20)	=	Sum of taxable income by income class
PTBO(20, 8)	=	Ratio, all ONTARIO taxable income to all CANADIAN taxable income
SM(8)	=	Sum of taxable income by exemption class
SD(8)	=	Sum of returns, by exemption class
TB(20, 8)	=	Taxable income by income and dependency class, ONTARIO

SDI(20)	=	Sum of returns by income class
SC(20, 8)	=	Cost of credit by personal exemption class and income
SNTR	=	Sum of returns, CANADA
STRO	=	Sum of taxable returns, ONTARIO
STBO	=	Sum of taxable income, ONTARIO
SINO	=	Sum of total income, ONTARIO
STO	=	Sum of total tax, ONTARIO
DELS	=	Increment in single exemption, new bill
DELM	=	Increment in married exemption, new bill
CSUM	=	Total cost, property tax credit
TSC	=	Total cost, sales tax credit
HSUM	=	Total number of households
TBS8(20)	=	GITAN adjustment factors of taxable income, 1968
TBS2(20)	=	GITAN adjustment factors of taxable income, 1972.

C.2 FORMAT OF DATAFILE.

Variables are read in from the datafile in the following order:

XTRO	=	No. of taxfilers with taxable returns, ONTARIO
TINCO	=	Total income, ONTARIO
TBLO	=	Taxable income, ONTARIO
TXO	=	Total tax, ONTARIO
XNTR	=	Number of tax returns, CANADA
XARO	=	Total taxfilers, all returns, ONTARIO
XABLO	=	Total taxable income, all returns, ONTARIO
TXO	=	Total tax, all returns, ONTARIO
D	=	No. of tax returns, CANADA
TT	=	Taxable income, for each personal exemption class, CANADA
PTX	=	Average level of property tax by gross income class.

C.3 CLASSIFICATION OF DATA

Data is classified by gross income and dependency class.

The family status (dependency) classification is as follows:

Single ,	no dependents
"	one or more dependents
Married,	no dependents
"	one dependent
"	two dependents
"	three "
"	four "
"	five or more dependents.

The gross income classes used in the analysis are as follows:

$ 0 - 2,500
2,500 - 3,000
3,000 - 3,500
3,500 - 4,000
4,000 - 4,500
4,500 - 5,000
5,000 - 5,500
5,500 - 6,000
6,000 - 6,500
6,500 - 7,000
7,000 - 7,500
7,500 - 8,000
8,000 - 8,500
8,500 - 9,000
9,000 - 9,500
9,500 - 10,000
10,000 - 25,000
25,000 and over.

Information is aggregated up to $2,500 in all arrays where the GREEN BOOK gives a finer breakdown. Similarly, because not all arrays break down information between $10,000 and $25,000 this information is aggregated within the program.

Appendix D

DATA BASE

D.1 SOURCES

XTRO = No. of taxfilers with taxable returns, ONTARIO

TINCO = Total income, ONTARIO

TBLO = Taxable income, ONTARIO

TXO = Total tax, ONTARIO

Source: Taxable returns, Table 8, "All returns by Province and Income", Taxation Statistics, (Ottawa: Department of National Revenue, Taxation, 1970 edition), p.112.

XNTR = No. of tax returns, CANADA

Source: Table 2, "All returns by Income Classes", Taxation Statistics, op.cit., p.16-35.

XARO = Total taxfilers, all returns, ONTARIO

XABLO = Total taxable income, all returns, ONTARIO

TXO = Total tax, all returns, ONTARIO

Source: Table 8, Taxation Statistics, p.112. This data is classified only up to $5,000 gross income.

D = No. of tax returns, by dependency class, CANADA

TT = Taxable income, for each personal exemption class, CANADA

Source: Table 7A, "All returns by Marital Status, Dependents and Income", Taxation Statistics, op.cit., p.104-107.

PTX = Property tax by income class

Results of the Guelph analysis adjusted to a provincial basis and extrapolated to the target year of the analysis.

PROCRD

```
100%TIY,120
110$RPC
120 COMMON XTRO(20),TINCO(20),TBLO(20)
130 COMMON TXO(20),XNTR(20)
140 COMMON XARO(20),XABLO(20),TAX(20)
150 COMMON D(20,8),TT(20,8)
160 COMMON PNTR(20),ATO(20)
170 COMMON STT(20),PTBO(20,8)
180 COMMON SM(8),TB(20,8)
190 COMMON SD(8),SD1(20)
200 COMMON SC(20,8)
210 COMMON PTX(20)
211 COMMON TBS8(20),TBS2(20)
212C
213C
220C    PROVINCIAL CREDIT ANALYZER
230C    FOR PROPOSED SALES AND PROPERTY
240C    TAX CREDITS IN ONTARIO
241C
242C
243C
250C    ==========================================
260C    JAN.12,1972   BRIAN HULL
270C    TAX AND FISCAL POLICY BRANCH,
280C    DEPT. OF TREASURY AND ECONOMICS
290C    ==========================================
300C
310C
320C    SALES TAX CREDIT FORMULA-  LINE 3590 &FF
330C    PROPERTY TAX CREDIT FORM-  LINE 4740 &FF
340C
350C
360 DATA XTRO,TINCO,TBLO/60*0/
370C    XTRO  = NO. OF TAXFILERS WITH TAXABLE RETURNS, ONT.
380C    TINCO = TOTAL INCOME, ONT.
390C    TBLO  = TAXABLE INCOME, ONT.
400 DATA TXO,XNTR/40*0/
410C    TXO   = TOTAL TAX, ONT.
420C    XNTR  = NUMBER OF TAX RETURNS, CANADA
430 DATA  XARO,XABLO,TAX/60*0/
440C    XARO  = TOTAL TAXFILERS, ALL RETURNS, ONT.
450C    XABLO = TOTAL TAXABLE INCOME, ALL RETURNS, ONT.
460C    TAX   = TOTAL TAX ALL RETURNS, CAN.
470 DATA D/160*0/
480C    D     = NO. OF TAX RETURNS IN EACH PERSONAL
490C            EXEMPTION CLASS.  INITIALLY CANADA
500C            ADJUSTED TO ONT.
510C            D(I,J) IS A 20*8 MATRIX WITH "J":
520C          J=1  SINGLE, NO DEPENDENTS
530C          J=2  SINGLE, ONE OR MORE DEPENDENTS
```

PROCRD CONTINUED

```
540C          J=3  MARRIED, NO DEPENDENTS
550C          J=4  MARRIED,1
560C          J=5  MARRIED,2
570C          J=6  MARRIED,3
580C          J=7  MARRIED,4
590C          J=8  MARRIED,5+
600 DATA TT/160*0/
610C   TT     = TAXABLE INCME, FOR EACH PERSONAL EXEMPTION CLASS
620C             CANADA
630 DATA PNTR,ATO/40*0/
640C   PNTR   = RATIO, ALL ONTARIO TAXFILERS TO ALL CANADA
650C   ATO    = NOT USED
660 DATA STT/20*0/
670C   STT    = SUM OF TAXABLE INCOME BY INCOME CLASS
680 DATA PTBO/160*0/
690C   PTBO   = RATIO, ALL ONTARIO TAXABLE TO ALL
700C             CANADA TAXABLE
710 DATA SM,SD/16*0/
720C   SM     = SUM OF TAXABLE BY EXEMPTION CLASS
730C   SD     = SUM OF RETURNS BY EXEMPTION CLASS
740 DATA TB/160*0/
750C   TB     = TAXABLE, ONTARIO
760 DATA SD1/20*0/
770C   SD1    = SUM OF RETURNS BY INCOME CLASS
780 DATA SC/160*0/
790C   SC     = COST OF GIVEN CREDIT BY
800C             PERSONAL EXEMPTION CLASS
810 DATA PTX/20*0/
820C   PTX    = PROPERTY TAX LEVEL BY INCOME CLASS
830C   THE INCOME CLASSES USED FOR 1968 BASE DATA ARE:
840C   UP TO $2500 GROSS INCOME; 2.5-3.0(000);
850C   3.0-3.5;3.5-4.0;4.0-4.5;4.5-5.0;
860C   5.0-5.5;5.5-6.0;6.0-6.5;6.5-7.0;7.0-7.5;
870C   7.5-8.0;8.0-8.5;8.5-9.0;9.0-9.5;9.5-10;
880C   10-15;15-20;20-25;25+
890C   N.B.IN THE 1968 BASE YEAR DATA INCOME CLASSES FROM 10-25
900C   ARE COLLAPSED INTO ONE CLASS DUE TO DATA DEFICIENCES.
910 DATA SNTR,STRO/2*0/
920C   SNTR   = SUM OF RETURNS, CANADA
930C   STRO   = SUM OF TAXABLE RETURNS. ONT
940 DATA STBO,SINO,STO/3*0/
950C   STBO   = SUM OF TAXABLEINCOME, ONT.
960C   SINO   = SUM OF TOTAL INCOME, ONT.
970C   STO    = SUM OF TOTAL TAX ONT.
980 DATA DELS,DELM,ISW2/3*0/
990C   DELS   = INCREMENT IN SINGLE EXEMPTION, NEW BILL
1000C   DELM  = INCREMENT IN MARRIED EXEMPTION, NEW BILL
1010 DATA CSUM,TSC,HSUM/3*0/
1020C   CSUM  = TOTAL COST, PROPERTY TAX CREDIT
1030C   TSC   = TOTAL COST, SALES TAX CREDIT
```

PROCRD CONTINUED

```
1040C   HSUM    = TOTAL NO. OF HOUSEHOLDS
1045 DATA TBS8/0,.395,.649,.649,.731,.731,.793,.793,.854,.854,.854,
1046&  .854 ,.892,.892,.892,.892,.963,0,0,1.067/
1047 DATA TBS2/0,.568,.697,.697,.791,.791,.833,.833,.889,.889,.922,
1048& .922,  .953,.953,.953,.953,1.063,0,0,1.572/
1050 100 FORMAT(A6)
1060 PRINT,"DATAFILE",^*
1070 READ 100,FN
1080 CALL OPENF(1,FN)
1090 READ(1,)(XTRO(I),I=1,20)
1100 READ(1,) (TINCO(I),I=1,20)
1110 READ(1,) (TBLO(I),I=1,20)
1120 READ(1,) (TXO(I),I=1,20)
1130 READ(1,) (XNTR(I),I=1,20)
1140 READ(1,) (XARO(I),I=1,6)
1150 READ(1,) (XABLO(I),I=1,6)
1160 READ(1,)(TXO(I),I=1,6)
1170 DO 150 J=1,8
1180 READ(1,)(D(I,J),I=1,20)
1190 150 CONTINUE
1200 DO 160 J=1,8
1210 READ(1,)(TT(I,J),I=1,20)
1220 160 CONTINUE
1230 READ(1,)(PTX(I),I=1,20)
1240 CALLCLOSEF(1)
1250 SW=2
1260 ISW2=2
1270 ISW3=2
1272 ISW4=1
1280C   SW     = TABLE SWITCH- THE HIGHER THE VALUE THE FEWER THE
1290C            TABLES
1300C   ISW2   = 1  OLD TAX BILL
1310C          = 2  NEW TAX BILL
1320C   ISW3   =  1- BASE YR; 2- 1972; 3- 1973.
1322C   ISW4 = 1 - ADJ. FOR THE CHANGED PERSONAL EXEMPTIONS
1324C        = 2 ADJ. TAXABLE INCOME BY GITAN RESULTS
1330 200 FORMAT(2X,5(F8.2,2X))
1340 210 FORMAT(2X,5(F12.2,3X))
1350 212 FORMAT(2X,10(F8.2,2X))
1360 213 FORMAT(//)
1370 214 FORMAT (2X,8(F12.2))
1380 215 FORMAT(2X,"SINGLE",18X,"MARRIED")
1390 216 FORMAT(2X,"NO. OF DEPENDENTS")
1400 217 FORMAT(8X,"0",11X,"1",11X,"0",11X,"1",11X,"2",11X,"3",11X,"4",
1410& 11X,"5+")
1420C ADJ. OF NO. OF TAXFILERS AND DEPENDENTS
1430C
1440C
1450 DO 300 I=1,20
1460 SNTR=XNTR(I)+SNTR
```

PROCRD CONTINUED

```
1470 STRO =XTRO(I)+STRO
1480 300 CONTINUE
1490C
1500C
1510C
1520 DO 350 I=7,20
1530 350 XARO(I)=XARO(I)+XTRO(I)
1540C
1550C
1560 XARO(17)=XARO(17)+XARO(18)+XARO(19)
1570 XARO(18)=0
1580 XARO(19)=0
1590C
1600 XNTR(17)=XNTR(17)+XNTR(18)+XNTR(19)
1610 XNTR(18)=0
1620 XNTR(19)=0
1630C
1631 DO 295 J=1,8
1632 TT(17,J)=TT(17,J)+TT(18,J)+TT(19,J)
1634 295 CONTINUE
1635 TBLO(17)=TBLO(17)+TBLO(18)+TBLO(19)
1640C
1650C
1660C CANADA TO ONTARIO ADJUSTMENTS
1670 DO380 I=1,20
1680 PNTR(I)=XARO(I)/XNTR(I)
1690 380 CONTINUE
1700 IF(SW.NE.1) GO TO 381
1710 PRINT,"ADJ. FACTOR, TAXFILERS,CANADA TO ONT"
1720 PRINT,"=============================="
1730 DO382 I=1,20
1740 PRINT 212,PNTR(I)
1750 382 CONTINUE
1760 381 CONTINUE
1770 PRINT 213
1780 IF(SW.GT.2) GO TO 388
1790 PRINT,"NO.OF  TAXFILERS,CANADA"
1800 PRINT,"======================="
1810 PRINT,"  BASE YEAR"
1820 DO 386 I=1,20
1830 PRINT 212,(D(I,J),J=1,8)
1850 386 CONTINUE
1860 DO387J=1,8
1870 DO387 I=1,20
1880 SD(J)=SD(J)+D(I,J)
1890 387 CONTINUE
1900 PRINT212,(SD(J),J=1,8)
1910 388 CONTINUE
1920 PRINT 213
1930 DO 390 I=1,20
```

PROCRD CONTINUED

```
1940 DO 390 J=1,8
1950 D(I,J)=D(I,J)*PNTR(I)
1960 D(I,J)=D(I,J)*.9989
1970C .9989 ADJUSTS ESTIMATED TAXFILERS TO OBSERVED ONTARIO TOTALS
1980 IF(ISW3.NE.2)GOTO391
1990 D(I,J)=D(I,J)*1.18893
2000C 1.18893 ADJUSTS TAXFILERS TO EXPEC. LEVELS 1972
2010C IN ONTARIO  (JAN.4,1972)
2020 391 CONTINUE
2030 IF(ISW3.NE.3)GOTO392
2040 D(I,J)=D(I,J)*1.2510
2050C 1.2510 ADJUSTS TAXFILERS TO EXPEC. 1973
2060 392 CONTINUE
2070 390 CONTINUE
2080C
2090C
2100 DO 425 I=1,20
2110 DO 425 J=1,8
2120 SD1(I)=SD1(I)+D(I,J)
2130 425 CONTINUE
2140 IF(SW.GT.4) GO TO 426
2150 PRINT 213
2152 PRINT213
2154 PRINT 213
2160 PRINT,"    XTRO       XARO       SD1"
2170 PRINT,"    ====       ====       ==="
2180 DO 430 I=1,20
2190 PRINT 212,XTRO(I),XARO(I),SD1(I)
2200 430 CONTINUE
2210 426 CONTINUE
2220 PRINT 213
2230C
2240C ADJ TAXABLE INCOME
2250 DO 500 I=1,20
2260 STBO=TBLO(I)+STBO
2270 SINO =TINCO(I)+SINO
2280 STO =TXO(I)+STO
2290 500 CONTINUE
2300 IF(SW.GT.4) GO TO 505
2310 PRINT,"TOTAL TAXABLE ,ONT",STBO
2320 PRINT,"TOTAL INCOME,ONT",SINO
2330 PRINT,"TOTAL TAX, ONT.",STO
2340 505 CONTINUE
2350C
2360 PRINT213
2370C
2380 DO 510 I=1,20
2390 STT(I)=TT(I,1)+TT(I,2)+TT(I,3)+TT(I,4)
2400& +TT(I,5)+TT(I,6)+TT(I,7)+TT(I,8)
2410 510 CONTINUE
```

PROCRD CONTINUED

```
2420 DO511 I=1,20
2430 DO511 J=1,8
2440 PTBO(I,J)=TBLO(I)/STT(I)
2450 511 CONTINUE
2460 IF(SW.GT.5) GO TO 516
2462 PRINT 213
2464 PRINT 213
2470 PRINT,"ADJ.FACTOR ,TAXABLE INCOME,CANADA TO ONT."
2480 PRINT,"=========================================="
2490 DO 512 I=1,20
2500 PRINT 212,(PTBO(I,J),J=1,8)
2510 512 CONTINUE
2520 516 CONTINUE
2530 DO 515 I=1,20
2540 SM(1)=SM(1)+TT(I,1)
2550 SM(2)=SM(2)+TT(I,2)
2560 SM(3)=SM(3)+TT(I,3)
2570 SM(4)=SM(4)+TT(I,4)
2580 SM(5)=SM(5)+TT(I,5)
2590 SM(6)=SM(6)+TT(I,6)
2600 SM(7)=SM(7)+TT(I,7)
2610 SM(8)=SM(8)+TT(I,8)
2620 515 CONTINUE
2630 IF(SW.GT.6) GO TO 522
2640 PRINT213
2642 PRINT 213
2650 PRINT,"TAXABLE INCOME,VERTICAL SUM ,CANADA"
2660 PRINT,"=================================="
2670 PRINT 212,(SM(J),J=1,8)
2680 PRINT213
2690 522 CONTINUE
2695 SUM=0
2700 DO 525 I=1,20
2710 DO 525 J=1,8
2720 TB(I,J)=TT(I,J)*PTBO(I,J)
2730 TB(I,J)=TB(I,J)*1.0831
2735 SUM=SUM+TB(I,J)
2740C  1.0831 IS THE NORMALIZATION FACTOR WHICH ADJUSTS EST. TO ACTUAL TAX
2750 IF(ISW3.NE.2)GOTO527
2760 TB(I,J)=TB(I,J)*1.76805
2770C 1.76805 IS THE EXTRAP. OF ONTARIO TAXABLE INCOME TO 1972 (MAR.10,'72
2771C IT IS COMPOSED OF TWO FACTORS:
2772C    1. 1.44717, THE INCREASE IN GPP OVER THE INTERVAL
2773C    2. 1.2217, THE INCREASE IN TAXABLE AS A % OF
2774C       ACCRUED INCOME OVER THE INTERVAL (.5014/.4104)
2775C       UNDER THE PROPOSED TAX SYSTEM
2780C
2781C
2782C
2790 527 CONTINUE
```

PROCRD CONTINUED

```
2800 IF(ISW3.NE.3)GOTO528
2810 TB(I,J)=TB(I,J)*1.9313
2820C 1.9313 ADJUSTS TAXABLE TO EXPEC 1973
2830 528 CONTINUE
2840 525 CONTINUE
2845 PRINT ,SUM
2850 IF(SW.GT.6) GO TO 532
2852 PRINT 213
2854 PRINT 213
2860 PRINT,"NO. OF TAXFILERS,ONTARIO"
2870 PRINT,"========================="
2880 DO 530 I=1,20
2890 PRINT 212,(D(I,J),J=1,8)
2900 530 CONTINUE
2901 DO 529 J=1,8
2902 SD(J)=SD(J)*0
2903 529 CONTINUE
2910 DO400J=1,8
2920 DO400I=1,20
2930 SD(J)=SD(J)+D(I,J)
2940 400 CONTINUE
2941 SNTR=0
2942 DO401 J=1,8
2943 SNTR=SNTR+SD(J)
2944 401 CONTINUE
2950 PRINT,"TOTAL"
2960 PRINT 212,(SD(J),J=1,8)
2970 PRINT 213
2980 532 CONTINUE
2990 IF(SW.GT.6) GO TO 536
3000 PRINT,"TAXABLE INCOME,ONTARIO"
3010 PRINT,"======================"
3020 PRINT,"    OLD BILL"
3030 DO 535 I=1,20
3040 PRINT212,(TB(I,J),J=1,8)
3050 535 CONTINUE
3051 536 CONTINUE
3061 DO 538 I=1,20
3062 DO 537 J=1,8
3063 ATO(I)=ATO(I)+TB(I,J)
3064 537 CONTINUE
3065 538 CONTINUE
3066 DO 539 I=1,20
3068 PRINT210,ATO(I)
3069 539 CONTINUE
3070 DELS=500.
3080 DELM=850.
3090 DO543 I=1,20
3100 DO 543 J=1,8
3110 TB(I,J)=TB(I,J)*1000.
```

PROCRD CONTINUED

```
3120 TB(I,J)=TB(I,J)*1000.
3130 D(I,J)=D(I,J)*1000.
3140 543 CONTINUE
3150 IF(ISW2.NE.2) GOTO549
3155 IF(ISW4.NE.1) GO TO 910
3160 PRINT213
3170 PRINT,"TAXABLE INCOME ,ONTARIO"
3180 PRINT,"=========================="
3190 PRINT,"    NEW BILL"
3200 DO544 I=1,20
3210 DO 544 J=1,2
3220 TB(I,J)=TB(I,J)-(DELS*D(I,J))
3230 IF(TB(I,J).LE.0)TB(I,J)=0
3240 544 CONTINUE
3250 DO 547 I=1,20
3260 DO 547 J=3,8
3270 TB(I,J)=TB(I,J)-(DELM*D(I,J))
3280 IF(TB(I,J).LE.0) TB(I,J)=0
3290 547 CONTINUE
3300 DO 548 I=1,20
3310 DO548 J=1,8
3320 TI(I,J)=TB(I,J)/1000000.
3330 548 CONTINUE
3340 DO550 I=1,20
3350 PRINT212,(TI(I,J),J=1,8)
3360 550 CONTINUE
3370 PRINT 213
3371 GO TO 549
3372 910 CONTINUE
3373 IF(ISW3.NE.1) GO TO 935
3374 DO 915 I=1,20
3375 DO 914 J=1,8
3376 TB(I,J) =TB(I,J)*TBS8(I)
3377 914 CONTINUE
3378 915 CONTINUE
3379 GO TO 999
3380 935 CONTINUE
3381 IF(ISW3.NE.2) GO TO 850
3382 DO 916 I=1,20
3383 DO 917 J=1,8
3384 TB(I,J)=TB(I,J)*TBS2(I)
3385 917 CONTINUE
3386 916 CONTINUE
3387C
3388 PRINT213
3389 999 CONTINUE
3390 DO 947 I=1,20
3391 DO 947 J=1,8
3392 TI(I,J)=TB(I,J)/1000000.
3393 947 CONTINUE
```

PROCRD CONTINUED

```
3394 PRINT,"TAXABLE INCOME,ONT."
3395 PRINT,"=================="
3396 PRINT,"NEW TAX ACT,GITAN METHOD"
3397 DO950 I=1,20
3398 PRINT212,(TT(I,J),J=1,8)
3399 950 CONTINUE
3403C
3404C
3405 549 CONTINUE
3406 DO540 I=1,20
3407 DO 540 J=1,8
3410 GO TO (601,602,603,604,605,606,607,608),J
3420C   XY/  SINGLE 0,1;  MARRIED 1-6
3430 601 XY=0
3440 GO TO 610
3450 602 XY=1
3460 GO TO610
3470 603 XY=1
3480 GO TO610
3490 604 XY=2
3500 GO TO 610
3510 605 XY=3
3520 GO TO 610
3530 606 XY=4
3540 GO TO 610
3550 607 XY=5
3560 GO TO 610
3570 608 XY=6
3580 610 CONTINUE
3590 SC(I,J)=(1.+XY)*D(I,J)*10.
3600 SC(I,J)=SC(I,J)-.01*IB(I,J)
3610 IF(SC(I,J).LE.0) SC(I,J)=0
3620 540 CONTINUE
3622 PRINT 213
3624 PRINT 213
3626 PRINT 213
3628 PRINT213
3630 PRINT,"TOTAL SALES TAX CREDIT BY DEPENDENCY CLASS"
3640 PRINT,"=========================================="
3650 IF(ISW2.EQ.2) PRINT,"   (NEW BILL)"
3660 PRINT 215
3670 PRINT 216
3680 PRINT 217
3690 DO 545 I=1,20
3700 PRINT214,(SC(I,J),J=1,8)
3710 545 CONTINUE
3720 DO546 J=1,8
3730 546 SM(J)=SM(J)*0
3740 DO650 J=1,8
3750 DO650 I=1,20
```

PROCRD CONTINUED

```
3760 650 SM(J)=SM(J)+SC(I,J)
3770 PRINT,"   TOTAL"
3780 PRINT 214,(SM(J),J=1,8)
3790 PRINT 213
3800 PRINT,"AVERAGE COST OF SALES TAX CREDIT"
3810 PRINT,"=============================="
3820 PRINT 215
3830 PRINT216
3840 PRINT217
3850 DO934 I=1,20
3860 DO 934 J=1,8
3870 SC(I,J)=SC(I,J)/D(I,J)
3880 934 CONTINUE
3890 DO 936 I=1,20
3900 PRINT 214,(SC(I,J),J=1,8)
3910 936 CONTINUE
3920 DO 655 J=1,8
3930 655 TSC=TSC+SM(J)
3940 PRINT 213
3950 PRINT,"REVENUE COST OF SALES TAX CREDIT"
3960 PRINT,"-------------------------------"
3970 IF(ISW2.EQ.2) PRINT,"   (NEW BILL)"
3980 PRINT 214,TSC
3990 PRINT 213
4000C   Q/  1-8: ADJUSTMENT FACTORS TO REDUCE TAXFILER DATA TO
4010C          HOUSEHOLD DATA
4020 Q1=.95
4030 Q8=.63
4040 DO 656 I=1,20
4050 D(I,2)=D(I,2)*Q1
4060 D(I,1)=D(I,1)*Q8
4070 656 CONTINUE
4080 Q2=.4
4090 Q3=.5
4100 Q4=.6
4110 Q5=.8
4120 Q6=.95
4130 Q7=.905
4135 Q9=.3
4140 D(1,1)=D(1,1)*Q9*Q7
4150 D(2,1)=D(2,1)*Q2*Q7
4160 D(3,1)=D(3,1)*Q3*Q7
4170 D(4,1)=D(4,1)*Q4*Q7
4180 D(5,1)=D(5,1)*Q5*Q7
4190 D(6,1)=D(6,1)*Q6*Q7
4200 DO 700 I=1,20
4210 700 SD1(I)=SD1(I)*0
4220 DO710 I=1,20
4230 DO 710 J=1,8
4240 SD1(I)=SD1(I)+D(I,J)
```

PROCRD CONTINUED

```
4250 710 CONTINUE
4260 DO712I=1,20
4270 SD1(I)=SD1(I)/1000.
4280 712 CONTINUE
4290 PRINT 213
4292 PRINT 213
4300 PRINT,"NO. OF HOUSEHOLDS BY INCOME CLASS"
4310 PRINT,"================================="
4320 DO714 I=1,20
4330 PRINT210,SD1(I)
4340 714 CONTINUE
4350 DO 711 J=1,8
4360 711 SM(J)=SM(J)*0
4370 DO 720 I=1,20
4380 HSUM=HSUM+SD1(I)
4390 720 CONTINUE
4400 DO 730 J=1,8
4410 DO 730 I=1,20
4420 SM(J)=SM(J)+D(I,J)
4430 730 CONTINUE
4440 DO731 J=1,8
4450 731 SM(J)=SM(J)/1000.
4460 PRINT,"NO. OF HOUSEHOLDS BY DEPENDENCY CLASS"
4470 PRINT,"==================================="
4480 PRINT 214,(SM(J),J=1,8)
4490 PRINT213
4500 PRINT,"NO. OF TAXFILERS, ONTARIO"
4510 PRINT,"--------------------------"
4520 PRINT 214,(SD(J),J=1,8)
4522 PRINT 213
4524 PRINT,"TOTAL NUMBER OF TAXFILERS"
4525 PRINT,"========================="
4526 PRINT 214,SNTR
4528 PRINT213
4530 PRINT,"TOTAL NO OF HOUSEHOLDS"
4540 PRINT,"======================"
4550 PRINT 214,HSUM
4560 TB(1,1)=TB(1,1)*Q9*Q7
4570 TB(2,1)=TB(2,1)*Q2*Q7
4580 TB(3,1)=TB(3,1)*Q3*Q7
4590 TB(4,1)=TB(4,1)*Q4*Q7
4600 TB(5,1)=TB(5,1)*Q5*Q7
4610 TB(6,1)=TB(6,1)*Q6*Q7
4620 DO 732 I=1,20
4630 TB(I,1)=TB(I,1)*Q8
4640 TB(I,2)=TB(I,2)*Q1
4650 732 CONTINUE
4660 PRINT213
4670 PRINT,"PROPERT TAX AVERAGE,PER HOUSEHOLD"
4680 PRINT,"---------------------------------"
```

PROCRD CONTINUED

```
4690 DO749 I=1,20
4700 PRINT212,PTX(I)
4710 749 CONTINUE
4720 DO 750 I=1,20
4730 DO 750 J=1,3
4740 SC(I,J)=(90.0+PTX(I)*.10)*D(I,J)
4750 SC(I,J)=SC(I,J)-.01*TB(I,J)
4760 IF(SC(I,J).LE.D(I,J)*0.) SC(I,J)=D(I,J)*0.
4770 750 CONTINUE
4780 PRINT 213
4790 PRINT,"COST OF PROPERTY TAX CREDIT"
4800 PRINT,"=========================="
4820 IF(ISW2.EQ.2) PRINT,"   (NEW BILL)"
4830 PRINT 216
4840 PRINT 216
4850 PRINT 217
4860 DO 760 I=1,20
4870 PRINT 214,(SC(I,J),J=1,3)
4880 760 CONTINUE
4890 761 CONTINUE
4900 DO 780 I=1,20
4910 780 SD1(I)=SD1(I)*0
4920 DO 790 I=1,20
4930 DO 790 J=1,3
4940 790 SD1(I)=SD1(I)+SC(I,J)
4950 DO 800 J=1,3
4960 800 SM(J)=SM(J)*0
4970 DO 805 J=1,3
4980 DO 805 I=1,20
4990 805 SM(J)=SM(J)+SC(I,J)
5000 PRINT 213
5010 PRINT,"COST OF CREDIT BY INCOME CLASS"
5020 PRINT,"=============================="
5030 IF(ISW2.EQ.2) PRINT,"   (NEW BILL)"
5040 DO 810 I=1,20
5050 PRINT 214,SD1(I)
5060 810 CONTINUE
5070 PRINT 213
5080 PRINT,"COST OF CREDIT BY DEPENDENCY CLASS"
5090 PRINT,"=================================="
5100 IF(ISW2.EQ.2) PRINT,"   (NEW BILL)"
5110 PRINT 214,(SM(J),J=1,3)
5120 PRINT213
5130 PRINT,
5140 PRINT,
5150 DO 820 J=1,3
5160 CSUM=CSUM+SM(J)
5170 820 CONTINUE
5180 PRINT,"COST OF PROPERTY TAX CREDIT "
5190 PRINT,"============================"
```

[illegible] CONTINUED

```
5200 IF(ISW2.EQ.2) PRINT,"    (NEW BILL)"
5210 PRINT 214,CSW1
5220 PRINT 213
5230 PRINT,"AVERAGE COST OF PROPERTY TAX CREDIT"
5240 PRINT,"=================================="
5250 PRINT 215
5260 PRINT 216
5270 PRINT 217
5280 IF(ISW2.EQ.2) PRINT,"    (NEW BILL)"
5290 DO 830 I=1,20
5300 DO 830 J=1,8
5310 SC(I,J)=SC(I,J)/D(I,J)
5320 830 CONTINUE
5330 DO 840 I=1,20
5340 PRINT 214,(SC(I,J),J=1,8)
5350 840 CONTINUE
5360 PRINT 213
5370 850 CONTINUE
5380 STOP
5390 END
```

MANUAL

ANALYSIS OF THE REVENUE AND INCIDENCE EFFECTS OF TAX CREDITS IN GUELPH

"GUELPHCRED"

Brian Hull

October 23, 1972

Taxation and Fiscal Policy Branch
Ministry of Treasury, Economics and
and Intergovernmental Affairs

TABLE OF CONTENTS

Chapter

I INTRODUCTION

II DESCRIPTION OF PROGRAM

III APPLICATION OF PROGRAM TO ANALYSIS

Appendix

A TABLES GENERATED

A.1 Summary
A.2 Tables
(i) General Parameters
(ii) General Tables
(iii) Summary Tables
(iv) Statistical Summaries

B PROGRAM OUTLINE

B.1 Summary

B.2 Income Tax Structures

B.3 Extrapolation Procedure

B.4 Taxfiler Dependency Characteristics

C PROGRAM STRUCTURE

C.1 Summary

C.2 Subroutine Outline

C.3 Tax Credit Formulae

C.4 Detailed Documentation

D PARAMETER DATAFILE

E PARAMETER DATAFILE LISTING

F PROGRAM LISTING

G GUELPH MATCHING PROGRAM BY HARRY NEWTON

H NUMERIC CONVERSION BY HELMUT GIESE

I. INTRODUCTION

The Guelph Tax Analyzer Model is an addition to the growing number of computer simulation models employed in the development and testing of proposed and legislated modifications to the personal income tax structure.[1] Since 1969, tax analysis through computer simulation has become a routine element in the process of policy development and monitoring carried on within the Ontario Treasury.[2]

The Guelph Model was designed for the purpose of testing alternative approaches to the integration of property taxes and income taxes through the device of tax credits. It is unique in its integration of property tax and income tax records. It examines the detailed incidence of property taxes and the redistributive effects of alternative tax credit formulae. For purposes of designing the property tax credit, the incidence of

---

1. The earliest models in this field were: John Bossons, "A General Income Tax Analyzer", Royal Commission on Taxation, Staff Study 25, (Ottawa: Queen's Printer, 1967) and Joseph A. Pechman, "A New Tax Model for Revenue Estimating", in Alan T. Peacock and Gerald Hauser, editors, Government Finance and Economic Development (Paris: O.E.C.D., 1965).

2. Analysis of the Federal Tax Reform Proposals, Ontario Studies in Tax Reform 1 (Toronto: Department of Treasury and Economics, 1970): Effects of Ontario's Personal Income Tax Proposals, Ontario Studies in Tax Reform 2 (Toronto: Department of Treasury and Economics, 1970): and Tax Reform and Revenue Growth to 1980, Ontario Studies in Tax Reform 4 (Toronto: Department of Treasury and Economics, 1971).

property taxes was examined for the principal income recipient in each household. Further examination of property tax incidence was done for household income and by age group. This extensive analysis of the incidence of property taxes has provided valuable information on the pattern of housing consumption.

The large variance in property tax level makes knowledge of the range of relief which a particular credit formula would make available to heads of household with similar levels of current income espectially important. The Guelph Model marks a further step towards a capability to anlayze the total burden of taxes by income class along the lines of Richard Musgrave's path-breaking work of 1951.[3]

---

3. Richard A. Musgrave, "Distribution of Tax Payments by Income Groups: A Case Study for 1948", National Tax Journal, March, 1951, pp. 1-53. Such an application of the computer simulation approach is proposed by Joseph A. Pechman in "A new Tax Model for Revenue Estimating", op. cit. p. 240.

II. DESCRIPTION OF PROGRAM

The Guelph Analyzer Model is a computer model designed to examine the incidence of residential property taxes in Guelph and test the redistributive effects of alternative tax credit formulae.

The model uses the individual tax records for residents of Guelph in 1968. These were stored on computer tape in the provincial master file and matched with the corresponding assessment records of the City of Guelph. The Guelph assessment information was recorded on computer tape following complete re-assessment at market values of the residential properties in the municipality. The joining of an individual income tax return to the corresponding assessment record was done by a computer program which ensures the complete anonymity of the individuals whose records are used in the analysis.

Income taxes are examined under the provisions of the Income Tax Act as it existed up to December 1971 (omitting the special in-year tax reduction of 3 per cent) and under the new tax act which came into effect January 1972. The analysis is conducted for 1968, the year for which the data is derived and for 1972. There is no distinction in the analysis between properties which are owner-occupied and those which are rented. The results indicated both the incidence of property taxes and the impact effects of the property tax credit. The final incidence of the property tax credit depends on how housing prices are affected by the change from a uniform

exemption per household to tax relief dependent upon both income and property taxes paid.[1]

The method used in this study is analogous to that employed in earlier studies in this series.[2] In examining the current tax system, the model allows for the change in personal exemptions, the major alternation in the tax base between it and the former system. The model also allows for the change in the dividend tax credit but because of data limitations in the master taxfile, does not include other modifications in the tax base.[3]

---

1. Under conditions where the withdrawal of the basic shelter exemption reduces the price of supermarginal houses proportionately to the decrease in price of marginal houses, the final incidence of the removal of the basic shelter allowance is on the occupier, whether he is the owner or the tenant. Quantitative assessments of the difference between the final incidence of a tax charge on owners and tenants have not been attempted. See Herbert A. Simon, "The Incidence of a Tax or Urban Real Estate", page 428 in Richard A. Musgrave and Carl S. Shoup, Readings in the Economics of Taxation (Homewood: Richard Irwin Inc., 1959).

2. See: Analysis of the Federal Tax Reform Proposals, op. cit.; Effects of Ontario's Personal Income Tax Proposals, op. cit.; and Tax Reform and Revenue Growth to 1980, op. cit.

3. In the analysis of the current tax system, the differences between it and the former system which have not been taken into account are: the standard employee expense allowances; deductibility of U.I.C. contributions and taxation of U.I.C. benefits; attribution of employee medical contributions and sickness and accident benefits from private plans; the changed definition of medical expenses; and the inclusions of scholarship and fellowship income and the special student allowance.

The Data Base

In 1968, there were 15,407 residential properties in Guelph.[4] In the match of income tax and property assessment records, it was possible to identify 8,779 of the properties and assign to them the tax returns of the occupants. For about 3,235, identification was impossible. These properties were not labelled by an individual name but were described as vacant lots or vacant dwellings, called "owner-occupied", owned by companies or lots "owned by listed tenants". The balance of 3,393 could not be matched because surnames on the income tax and assessment records did not correspond for a given address. This group accounts for about 22 per cent of the total. As about a fifth of all households change address every year, most of this mismatch is due to removals and some is caused by inconsistent spelling of names between property assessment and income tax records. As both owner-occupied and rental accommodation are assessed at market value in Guelph, this study does not distinguish between the two forms of tenure. The matched records include those for both owner-occupied and rented accommodation.

The Extrapolation from 1968 to 1972

In extrapolating the 1968 data base to 1972, the simplest procedure was used. The master taxfile from which the Guelph income tax records are taken contains information in a more summary form than does the intensive sample used for compilation of Taxation Statistics.[5]

---

4. Blue Book: 1968 Summary of Financial Reports of Municipalities (Toronto: Department of Municipal Affairs, 1968), page 1.

5. Taxation Statistics. Ottawa: Department of National Revenue: Taxation, 1970 Edition.

The detailed information of the intensive sample makes possible the relatively complex extrapolation procedure employed in Tax Reform and Revenue Growth to 1980. However, the intensive sample does not include surnames and addresses with the records.

In the extrapolation used in this study, the number of taxfilers and properties is increased by the estimated increase in the number of taxfilers in Ontario between 1968 and 1972. In a similar fashion, income of each taxfiler is increased by the change in average income in Ontario between 1968 and 1972. The forecast used for 1972 was under-taken by the Ontario Treasury.[6]

Property taxes in 1968 are calculated by applying the 1968 mill rate for Guelph to the sum of assessment for land and improvements for each unit. Where applicable, the special farm mill rate is applied. The total rate for Guelph in 1968 was 27.7 mills. This included a mill rate of 16.3 for general purpose; 6.7 for elementary schools and 4.7 mills for secondary schools. The special farm rate in 1968 was 24.7 mills. In 1968 residential property was re-assessed at market values in Guelph. It is to this assessment roll that the 1968 mill rate is applied in the study as the purpose is to examine the incidence of property taxes in a situation where the discrepancy between assessed and market values is at a minimum. For the 1972 analysis, the study assumes the 1971 mill rate of 30.6 remains unchanged in 1972.

---

6. Canadian and Ontario Economic Forecast (Toronto: Department of Treasury and Economics, Fall, 1971).

Distributions by Age Group and Family Income

Tests for differences in the incidence of property taxes among age groups and for alternative definitions of income are possible within the Guelph analysis. The population of principal income recipients in each household is divided into three age groups: Those less than 35 years of age in 1968, those between 35 and 64 years of age and those 65 years of age and over. The incidence of property taxes and the average value of the property tax credit is examined for each group. The incidence of property taxes on the entire group of households is also examined for a more inclusive definition of household income; that is, where the name of more than one income taxfiler in the household also appears on the property assessment record, household income is the sume of these incomes.

III. APPLICATION OF THE PROGRAM TO THE ANALYSIS

The program has been developed and run on the PDP 10 of Dataline Systems, Toronto. The certain matches are stored on one reel of computer tape, the total set of matches, certain and doubtful, on two. The criteria by which income tax returns are selected for analysis are set within subroutine XTAX.

Analysis of Principal Income Recipients
- XTAXA - Certain matches
- XTAXB - Total matches

Accummulated (Family) Income
- XTAXD - Certain matches
- XTAXC - Total matches

The age group subset analyzed is also specified in subroutine XTAX. The extrapolation requires the setting of switch IEXTRP in subroutines, XTAX, XACUM and XADJ. The switch is set at "1" for 1968 and "2" for 1972.

The first experimental run of income tax data alone was made September 13, 1971. The first full run of income tax data alone, October 9 and the first full run of matched data November 30, 1971. The extrapolation was added January 16, 1972. The formule adopted for the Ontario Property Tax Credit Plan was first tested March 8, and the final runs were made May 8, 1972.

Appendix A

TABLES GENERATED

A.1 SUMMARY

The Guelph Analyzer program examines matched income tax returns and property assessment rolls for residents of the City of Guelph. The 1968 income tax returns for residents of Guelph were selected from the Master File of Ontario income tax returns. The Master File contains summary information for each tax return filed within Ontario. Residential properties in Guelph were re-assessed in 1968 at market value. Storage of the income tax and assessment data on computer tape made possible a matching of records which avoided the necessity of visual inspection. The computer program which matched the income and property tax data is described in Appendix G.

The Guelph Analyzer computes the incidence, and distribution of property taxes, the incidence of the combined income and property tax burden, and the implications of alternative formulae for the relief of the property tax burden. The model reads each matched record in sequence. Each record is checked to determine whether it fits the selection criteria of the particular run. Thus, the data may be analyzed by age group, family income, income of principal income recipient and so on.

A.2 TABLES

I GENERAL PARAMETERS

1. Run identifiers.

   Location: Guelph
   Run No.:
   Run Year: (Year of data base or extrapolation)
   Run Date:

2. Income tax rate schedules.

   Old rate schedule
   New rate schedule

3. Property tax classes
   (Up to 30 classes)

4. Income tax classes
   (Up to 30 classes)

5. Property tax credit assumptions.

   Basic credit:
   Credit as % property tax:
   Credit as % assessment:
   Credit as % income:
   Maximum credit available:
   Average assessment:

II GENERAL TABLES

The format of these tables provides for a matrix of results of up to 30 columns of property tax classes and of up to 30 rows of income classes.

1. Number of taxfilers
2. Total accumulated income
3. Average gross income
4. Average property tax paid
5. Average income taxes paid, old tax structure
6. Average taxes paid, new tax structure
7. Average disposable income, new tax structure
8. Average disposable income as a per cent of gross income, new tax structure.

9. Average property tax credit, new tax structure
10. Total accumulated income tax, old tax structure
11. Total accumulated income taxes, new tax structure
12. Total accumulated property tax credit, old tax structure.
13. Total accumulated property tax credit, new tax structure.

III SUMMARY TABLES

Summary tables classify the data by income class only.

1. Summary tax deduction data.

   (i) Total accumulated income
   (ii) Total accumulated deductions
   (iii) Total accumulated medical receipts
   (iv) Total accumulated donations

2. Summary tax exemption data.

   (i) Total accumulated personal exemptions, actual data.
   (ii) Total estimated personal exemptions, old tax structure.
   (iii) Total estimated personal exemptions, new tax structure.
   (iv) Average estimated exemptions, old tax structure.

3. Summary dependency data.

   (i) No. of children under 16.
   (ii) No. of children over 16.
   (iii) No. of taxfilers.
   (iv) No. of taxfilers filing as single.

4. Summary tax credit data.

   (i) Total credit, old tax structure.
   (ii) Average credit, old tax structure.
   (iii) Total credit, new tax structure.
   (iv) Average credit, new tax structure.

5. Summary tax data.

   (i) Total taxes, old tax structure.
   (ii) Average taxes, old tax structure.
   (iii) Total taxes, new tax structure.
   (iv) Average taxes, new tax structure.

6. Incidence of property tax credit.

   (i) Credit % gross income, old structure.
   (ii) Credit % income tax, old structure.
   (iii) Credit % gross income, new structure.
   (iv) Credit % income tax, new structure.

7. Incidence of income taxes.

   (i) Income tax % gross income, old structure.
   (ii) Income tax less credit % gross income, old structure.
   (iii) Income tax % gross income, new structure.
   (iv) Income tax less credit % gross income, new structure.

8. Dividends

   (i) Total dividends from taxable, Canadian companies.
   (ii) Old dividend tax credit.
   (iii) New dividend tax credit.

IV STATISTICAL SUMMARIES

1. Median property class by income class.
2. Median income class by property class.
3. Mean property tax by income class.
4. Standard deviation, property tax by income class.
5. Average disposable income - by property class, gross income less income taxes.
6. Standard deviation, average disposable income.
7. Average disposable income - by income class, gross income less income taxes.
8. Standard deviation, average disposable income.
9. Average disposable income -by income class, gross income less property and income taxes.
10. Standard deviation.
11. Average disposable income - by income class, gross income, less tax plus credit.
12. Standard deviation.

Appendix B

PROGRAM OUTLINE

B.1 SUMMARY

This appendix presents an outline of the important assumptions and procedures incorporated in the Guelph Analyzer. It presents the income tax rate schedule used in the old and new tax structures, the extrapolation procedure and the method used to derive dependency characteristics from reported levels of personal exemptions.

B.2 INCOME TAX STRUCTURES

The income tax schedules employed in estimating the income tax burden under the old and new tax structures are taken from: Clarkson, Gordon and Co., Tomorrows Taxes: An Analysis of 1971 Tax Reform Legislation as Contained in Bill C-259 (Toronto: Clarkson, Gordon and Co., August 1971) p.15. This schedule is reproduced as Appendix Table B.1. The 1971 rate schedule does not include the in-year tax reduction introduced by the federal and Ontario authorities. The analysis of the new tax system within a 1972 environment does not include the increase of the special old age exemption from $650 to $1,000 as introduced in the federal budget of May 8, 1972.

The analysis under the new tax act takes into account the major modifications to the tax base, the changed exemptions for married, single, and old people. It also takes into account the new dividend tax credit.

The analysis under the new tax act does not take into account: the standard employment expense allowance, the new treatment of top employee benefits, the deductibility of U.I.C. contributions, the taxation of U.I.C. benefits, the attribution to employees of employer medicare contributions, sickness and accident benefits from private plans, the inclusion of scholarship and fellowship income, and the special student allowances, as well as the changed definition of medical expenses. The analysis also excludes effects on the personal deductions due to the increase in the limit on contributions to registered pension plans and deferred profit sharing plans to $2,500 from $1,500.

The combined effect of all modifications to the tax base listed above, with the exception of the capital gains tax and the increased limits on contributions to registered pension plans, is tested for the aggregate Ontario situation in the model "PROVCRED".[1]

---

1. Brian Hull, PROVCRED: Manual for the Analysis of the Revenue and Incidence Effects of Property and Sales Tax Credits in Ontario, op. cit., Appendix B.2

Table B.1

1971 AND 1972 PROPOSED RATES OF TAX APPLIED TO TAXABLE INCOME

Taxable income bracket		1971 (note 1)		1972 (note 2)	
		Tax on lower limit	Tax rate on excess	Tax on lower limit	Tax rate on excess
$ 0	$ 500	$ 0	4.00%	$ 0	22.1%
500	1,000	20	20.00	110	23.4
1,000	1,750	120	22.00	227	24.7
1,750	2,000	285	22.24	412	24.7
2,000	3,000	341	24.27	474	26.0
3,000	4,000	583	25.29	734	27.3
4,000	5,000	836	28.33	1,007	27.3
5,000	6,000	1,119	28.33	1,280	29.9
6,000	7,000	1,403	26.39	1,579	29.9
7,000	8,000	1,667	26.39	1,878	32.5
8,000	9,000	1,931	30.45	2,203	32.5
9,000	10,000	2,236	30.45	2,528	35.1
10,000	11,000	2,541	35.53	2,879	35.1
11,000	12,000	2,896	35.53	3,230	40.3
12,000	14,000	3,251	40.60	3,633	40.3
14,000	15,000	4,063	40.60	4,439	45.5
15,000	24,000	4,469	45.68	4,894	45.5
24,000	25,000	8,580	45.68	8,989	50.7
25,000	39,000	9,037	50.75	9,496	50.7
39,000	40,000	16,142	50.75	16,594	55.9
40,000	60,000	16,650	55.83	17,153	55.9
60,000	90,000	27,813	60.90	28,333	61.1
90,000	125,000	46,083	65.98	46,663	61.1
125,000	225,000	69,174	71.05	68,048	61.1
225,000	400,000	140,224	76.13	129,148	61.1
400,000	up	273,443	81.20	236,073	61.1

NOTES:

1. The 1971 tax schedule reflects the proposed reduction of the 3% surtax to 1½% (on tax in excess of $200), includes the 4% old age security tax and the 2% social development tax (on taxable income in excess of $1,000) and the revised rates proposed to be applicable to 1971 taxable incomes of less than $3,000. It also includes provincial tax at 28% of federal basic tax.
2. The 1972 tax schedule includes provincial tax at 30% of federal tax.

B.3 EXTRAPOLATION PROCEDURE

The extrapolation of the analysis from the 1968 data base is undertaken with the very simplest possible procedure. The number of taxfilers between 1968 and 1972 increases at the level projected for Ontario in the GITAN analysis. The number of taxfilers in each income, dependency class cell is increased by this factor. Between 1968 and 1972 the number of taxfilers in Ontario is estimated to increase by slightly more than the national average.

Income in Ontario is assumed to change between 1968 and 1972 by a factor which adopts the forecast performance of the Ontario economy in 1972.[1] Taxable income in Ontario increases more rapidly than income itself and this is allowed for in the analysis.

	1972/1968
Increase in total income	1.44717
Increase in no. of taxfilers	1.18893

The extrapolation procedure for the economic environment used in this analysis is the same as that used in the Provincial Analyzer, "PROVCRED".

The mill rate applied to the re-assessed 1968 data is the actual rate for 1968 taxes. However, it should be noted the new

---

1. Canadian and Ontario Economic Forecast (Toronto: Department of Treasury and Economics, Fall, 1971).

Table B.2

OLD TAX SYSTEM

ESTIMATION OF FAMILY STRUCTURE FROM TOTAL PERSONAL EXEMPTION CLAIMED

Personal Exemption Claimed	No. of $300 Exemptions	No. of $550 Exemptions	Married or Single
$1,000	0	0	1
1,300	1	0	1
1,550	0	1	1
1,600	2	0	1
1,850	1	1	1
1,900	3	0	1
2,000	0	0	2
2,100	0	2	1
2,150	2	1	1
2,200	4	0	1
2,300	1	0	2
2,400	1	2	1
2,450	3	1	1
2,500	5	0	1
2,550	0	1	2
2,600	2	0	2
2,650	0	3	1
2,700	2	2	1
2,800	6	0	1
2,850	1	1	2
2,900	3	0	2
2,950	1	3	1
3,100	0	2	2
3,150	2	1	2
3,200	4	0	2
3,250	2	3	1
3,400	1	2	2
3,450	3	1	2
3,500	5	0	2
3,550	3	3	1
3,650	0	3	2
3,700	2	2	2
3,800	6	0	2
3,850	4	3	1
3,950	1	3	2
4,100	7	0	2
4,200	4	0	2
4,250	2	3	2
4,500	1	4	2
4,550	3	3	2

NOTE: 1 indicates single; 2 indicates married. Classification assumed: single exemption is $1,000, married exemption is $2,000.

assessment roll was not used until 1969.

Guelph mill rates:

1968	27.70
1969	28.90
1970	32.97
1971	30.60

Increase in the Guelph mill rate, 1971 over 1968 is 11.02 per cent. This is an implicit rate of change of 2.65 per cent per annum. The analysis assumes the 1971 mill rate was applicable in 1972.

B.4 TAXFILER DEPENDENCY CHARACTERISTICS

The dependency characteristics of each taxfiler are ascertained from the personal exemption level claimed. Each level of personal exemptions is a combination of various exemptions. The age of the taxfiler is on each return. A different schedule of exemptions applies to those under and over 70 years of age.

The exemption level for those under 70 years of age is shown in Table B.2. Thus, for example, if the level of personal exemptions does not exceed $1,000, the taxfiler is filing as single with no dependants. Or if the personal exemption is greater than $2,700 and no greater than $2,800, then the taxfiler is filing as single with 6 children under 16 years of age.

The exemption level for those 70 years of age and over is shown in Table B.3.

Table B.3

OLD TAX SYSTEM

ESTIMATION OF FAMILY STRUCTURE
FOR TAXFILERS OVER 70 YEARS OLD.

	No. of $500 Exemptions	Married or Single	No. of $300 Exemptions	No. of $550 Exemptions
$1,000	0	1	0	0
1,300	0	1	1	0
1,500	1	1	0	0
1,800	1	1	1	0
1,850	0	1	1	1
2,000	0	2	0	0
2,050	1	1	0	1
2,150	0	1	2	0
2,300	0	2	1	0
2,500	1	2	0	0
2,650	1	1	2	1
2,800	1	2	1	0
2,900	1	1	1	2
3,000	2	2	0	0
3,200	1	1	2	2
3,300	2	2	1	0
3,550	2	2	0	1
3,850	2	2	1	1
4,700	2	2	2	2
5,000	2	2	3	2
5,700	2	2	3	3

Note: In married or single column: 1 indicates filing as single; 2 indicates filing as married. Classification is derived from total personal exemptions claimed. Under old tax structure single exemption is $1,000; married exemption is $2,000; and old age exemption for individuals 70 years old and older is $500.

Appendix C

PROGRAM STRUCTURE

C.1 SUMMARY

Each run of the program is preceded by preparation of the datafile which is read in at the outset and initializes the parameters. The datafile contains the label to the run, the credit system selected, the date of the run, the size of the income and property class arrays, the specification of the credit formula, the levels of the various personal exemptions, the income classes and the average and marginal rates under the old and new tax structures.

The extrapolation switch must be set separately in subroutines: TAXANL (XTAX in current version); ADJ (XADJ in current version; and ACCUM (XCUM in current version). The switch, IEXTRP, is set at 1 for analysis on a 1968 basis and 2 for analysis of the extrapolation to 1972.

The age group analyzed in the run is established with a statement in XTAX following the specification of IYOB = IYR. Thus, for example, an analysis of principal income earners of over 65 years of age requires the statement:

```
IF (IYOB. LE.69 AND.IYOB.GE.04) GO TO 92
```

The income characteristics of the household which are to be analyzed are assigned and the selection of the appropriate tax

returns for analysis is made in TAXANL. Normally this is for the tax return pertaining to the household with the largest gross income. However, it is also possible to accumulate all incomes pertaining to the address to learn the incidence of property tax on family income.

C.2 SUBROUTINE OUTLINE

MAIN: now XMAIN

Main program controls the parameter datafile read subroutine, the tax analysis system, and the table printing operations.

PARAM: now PARAM1

Reads parameter datafile.

TAXANL: now XTAX

Calls READIN, the subroutine which reads each tax record in sequence. TAXANL then assigns internal variable names to the read matrix. Next, the appropriate mill rate for the record is selected.

If PCLAS = 1 residential mill rate
If PCLAS = 2 special farm mill rate

The market value of the residential property is the sum of the value of the land and the improvements:

BUILD = XLAND + BUILD

The value of the property tax is then the mill rate applied to the market value of the property:

PROPT = MR* BUILD

TAXANL calls subroutines ADJ, RATESH, CREDIT and ACCUM. It also selects the income characteristics of the tax return to be analyzed.

RDIN: now READTP

This subroutine reads each tax record in sequence and attaches variable names.

ADJ: now XADJ

This subroutine estimates family structure from the size of personal exemptions claimed. Personal exemptions under the new tax act are then calculated assuming the estimated family structure.

For modifications of the program up to August 1972 no allowance was made for the increase in deductions possible following the increase in the limit on contributions to registered pension plans and deferred profit sharing plans.

RSCH: Does rate schedule calculations.

CRED: now XCRED

Does tax credit calculations.

ACCUM: now XACUM

Accumulates data.

C.3 TAX CREDIT FORMULAE

The subroutine CRED is programmed for three alternative property tax credit formulae. The option to examine a sales tax credit formulae is included with one of these three forms. The desired formula for the property tax credit is specified by setting the swithc NC in the datafile.

NC = 1

TAX CREDIT = BASIC CREDIT + a % PROPERTY TAX - b % TAXABLE INCOME.

If property tax is less than the basic credit, property tax equals the basic credit.

NC = 2

TAX CREDIT = BASIC CREDIT + a % PROPERTY TAX.

NC = 3

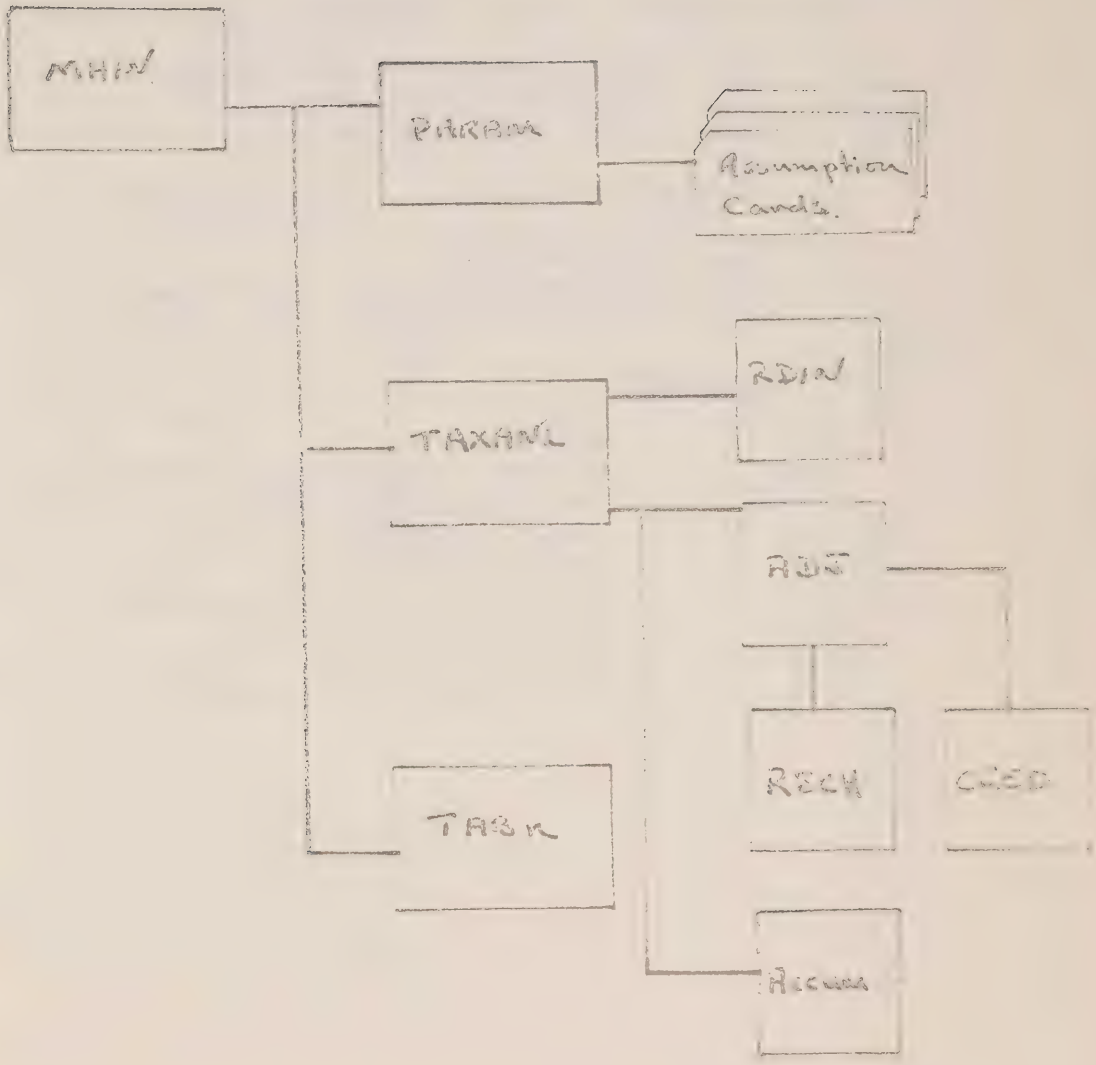
TAX CREDIT = BASIC CREDIT - a % TAXABLE INCOME.

If NC = 1 is chosen there is an option to select a sales tax credit formula. This is presently selected by removing a "GO TO" statement at the appropriate point in the CRED subroutine. The formula is $10 per member of the family less 1 per cent of taxable income.

Aug. 10, [illegible]

FLOW CHART

[illegible] ANALYSIS



August 10, 1971.

C.4 DETAILED DOCUMENTATION

PROPOSED SUBROUTINES

Basic program outline:

Main program: which controls

(a) Read parameters subroutine
(b) Do tax analysis subroutine
(c) Table printing operations

Tax analysis subroutine: which controls

(a) Read records
(b) perform operations (i)rate schedule (ii) credit
(c) accumulate data

Program names:

MAIN	:	main program
PARAM	:	program control and parameters
TAXANL	:	tax analysis control
RDIN	:	reads records
ADJ	:	basic calculations
RSCH	:	rate schedule calculations
CRED	:	credit calculations
ACCUM	:	accumulates data
TAB_n	:	table numbers, 1 to n.

August 10, 1971.

PROPERTY AND INCOME TAX ANALYZER

INPUT RECORD VARIABLES

NAME	LABEL
Identification characteristics	
Assessment number	LØC
Birth year	IYØB
Sample code	SAM
Income tax characteristics	
Income:	
Prior year loss	XLØS
Gross main source income	XINC
Foreign income	XFØR
Net dividends from taxable Cdn. companies	XDIV
Total income	XTØT
Deductions and exemptions:	
Deductions to total income	DED
Gross medical receipts	XMD
Donations	DØN
Personal exemptions	EXEMP
Taxable income:	
Taxable income	TAXI
Federal tax	FTAX
Provincial tax	PTAX
Foreign tax paid	FØRT
Federal foreign tax credit	FFTX
Provincial foreign tax credit	PFTX
Tax deducted at source	STAX
Tax adjustments	TADJ
Amount paid on filing	PAID
Computer calculated balance	CMBAL
Identification characteristics	
Sinno	SINNØ
Surname	SUR
Firt name	FNAME
Street address	ADD
Property tax data	
Assessment	ASS
Property class	PKLAS
Property tax payable	PRØPT

VARIABLE NAMES

LABEL	NAME
INPT, INPT1	input device code
IPOUT	output device code
K1	number of income classes
K2	number of property classes
K3	number of rate schedule classes (old tax schedule)
K4	number of rate schedules
K5	number of rate schedule classes (new tax schedule)
ARSH(i,j)	average rate of tax in class
BRSH(i,j)	bottom of tax class
RSH(i,j)	marginal rate of class
BCRED	basic property tax
CRED	credit as % of property tax
ACRED	credit as a % of assessment
XINCP	credit as % of income
CMAX	maximum credit available
AMAS	average municipal assessment level or per capita credit
EXEMS(j)	single person exemption
EXEM(j)	married exemption
EXA	old age exemption
CH1	children under 16
CH2	children 16 and over
ECH1	exemption children under 16
ECH2	exemption children 16 and over
EXE	employment expenses
XK(K1)	gross income classes (lower limit of class)
TXK(K1)	income class threshold levels
PKLAS(K2)	property classes (lower limit of class)
TP(K2)	property class threshold levels
SM(i,j)	summary classes

August 26, 1971.

ADDED VARIABLES

PROGRAM CONTROL

N1	=	record counter
NN	=	number of records
NC	=	credit type
INPT1	=	input device code for record file

August 17, 1971.

ACCUMULATION ARRAY

Variables to be accumulated by income class, where

i = income class, j = variable name.

RECORD LABEL	ARRAY LABEL	NAME
XTØT	SM (i,1)	Total income
DED	SM (i,2)	Deductions to income
XMD	SM (i,3)	Gross medical receipts
DØN	SM (i,4)	Donations
EXEMP	SM (i,5)	Personal exemptions
SN	SM (i,6)	Est. exemptions, new
SØ	SM (i,7)	Est. exemptions, old
TAXI	SM (i,8)	Taxable income
ØTAX	SM (i,9)	Est. taxable, old
NTAX	SM (i,10)	Est. taxable, new
FTAX	SM (i,11)	Federal tax
P TAX	SM (i,12)	Provincial tax
FF TX	SM (i,13)	Fed. for tax credit
PF TX	SM (i,14)	Prov.for tax credit
TXØ	SM (i,15)	Est. tax, old
TXN	SM (i,16)	Est. tax, new
CDØ	SM (i,17)	Est. prop. credit, old
CDN	SM (i,18)	Est. prop. credit, new
PRØPT	SM (i,19)	Property tax payable
ASS	SM (i,20)	Assessment
	SM (i,21)	Numbers of filers
CH1	SM (i,22)	Number of children under 16
CH2	SM (i,23)	Number of children 16 and ove
If MSTA = 1	SM (i,24)	Singles
If MSTA = 2	SM (i,25)	Marrieds

August 27, 1971.

ADDED VARIABLES

ANALYSIS

MSTA	=	Marital status, 1 if single, 2 if married.
KCH	=	Excess estimated children counter
DIFF	=	Record exemption less $1000.00
TXY	=	Taxable income, common term
ØTAX	=	Taxable income, estimated, old system
NTAX	=	Taxable income, estimated, new system
TXØ	=	Tax payable, old system
TXN	=	Tax payable, new system
CDØ	=	Property tax credit, old system
CDN	=	Property tax credit, new system

August 27, 1971.

ACCUMULATION ARRAY

Variables to be accumulated by income and property class, where IJ = income class, IK = property class.

RECORD LABEL	ARRAY LABEL	NAME
ØTAX	SØTAX(IJ,IK)	**Taxable Income** old system
NTAX	SNTAX(IJ,IK)	**Taxable Income** new system
CDØ	SCDØ(IJ,IK)	Property credit, old system
CDN	SCDN(IJ,IK)	Property credit, new system
SN1	SN1(IJ,IK)	Record counter
XTØT	STØT(IJ,IK)	Total income
PRØPT	SPRØP(IJ,IK)	Total property tax
TXØ	STXØ(IJ,IK)	Income tax payable, old system
TXN	STXN(IJ,IK)	Income tax payable, new system.

TABLES, PROPERTY Sept. 28/71

TAX ANALYSIS

TAB 1

1. Number of tax filers in each property class.
2. Total income in each property class.
3. Average gross income in each property class.
4. Average property tax paid in each class.

TAB 2

1. Average taxes paid, old tax structure.
2. Average taxes paid, new tax structure.
3. Difference in taxes (average).
4. Average property tax credit, old structure.
5. Average property tax credit, new structure.

TAB 3

1. Total taxes, old system (excl. prop. taxes)
2. Total taxes, new system (excl. prop. taxes)
3. Total property tax credit (old system)
4. Total property tax credit (new system)

TAB 4

1. Summary tax deduction data.

   (a) income class
   (b) total income
   (c) deductions
   (d) medical receipts
   (e) donations

2. Summary tax exemption data.

   (a) personal exemptions
   (b) estimated exemptions, old tax structure
   (c) estimated exemptions, new tax structure
   (d) average exemptions, old tax structure

3. Summary dependency data.

   (a) number of children under 16
   (b) number of children over 16

4. Summary tax credit data.

   (a) total credit, old tax structure
   (b) average credit, new tax structure
   (c) total credit, new tax structure
   (d) average credit, new tax structure

TAB 5

1. Summary tax data.

   (a) Taxes (excl. credit), old structure
   (b) Average taxes, old structure
   (c) Taxes (excl. credit), new structure
   (d) Average taxes, new structure

2. Incidence tables of credit.

   (a) Credit as % gross income.
   (b) Credit as to taxes (excl credit), old structure.
   (c) Credit as % gross income, new structure.
   (d) Credit as % taxes (excl. credit), new structure.

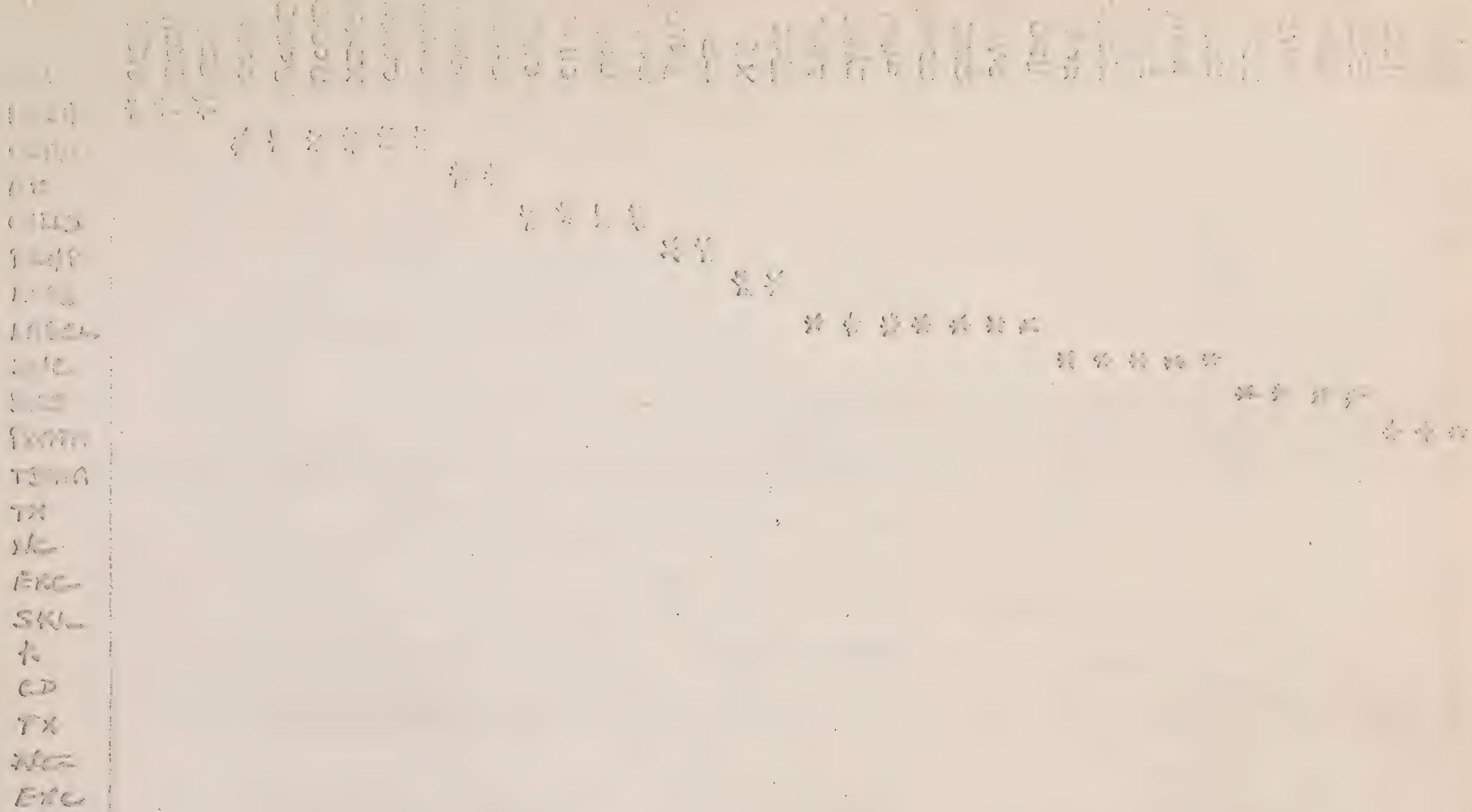
3. Incidence tables of taxes.

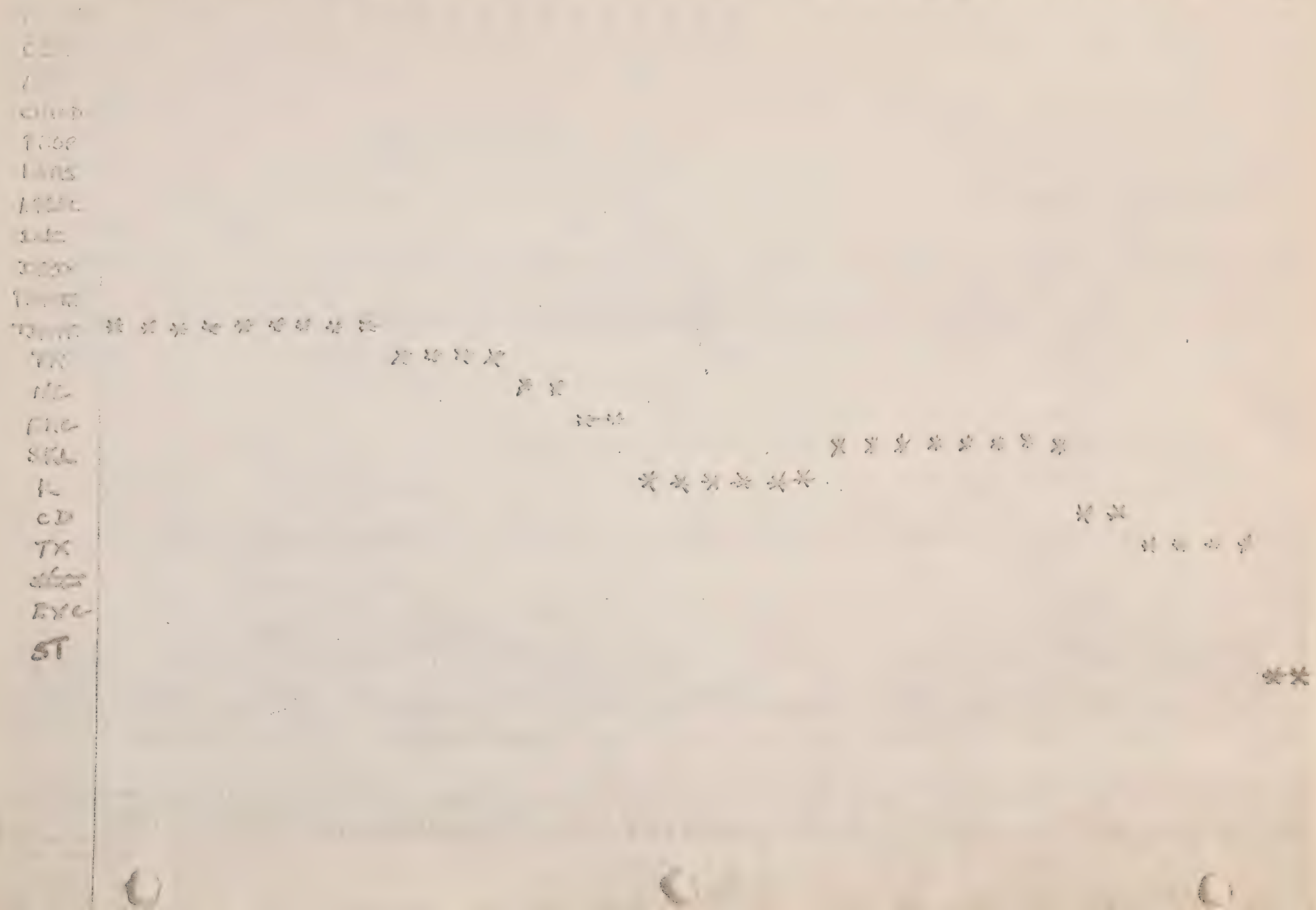
   (a) Taxes (excl. credit) as % gross income, old structure.
   (b) Taxes, with credit as % gross income, old structure.
   (c) Taxes (excl. credit) as % gross income, new structure.
   (d) Taxes, with credit as % gross income, new structure.

4. Not used.

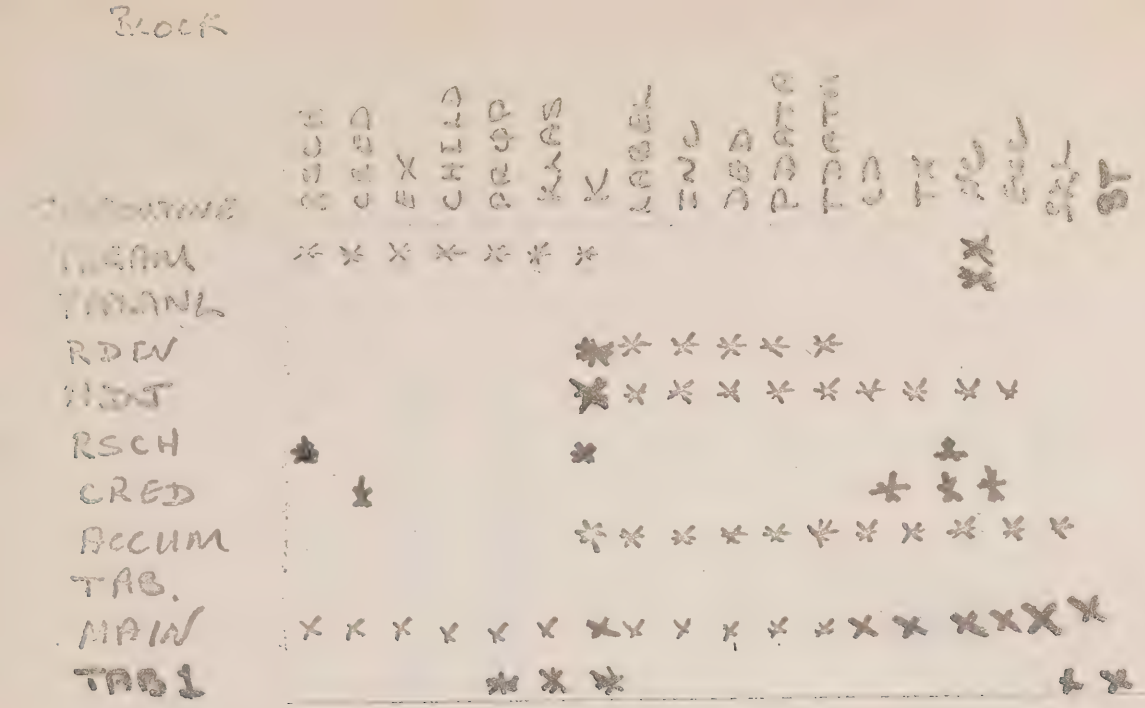
TAB 6

Statistical summary arrays.


TX
ERC
SKL
CD
TX
ERC


TX
CD
TX
EXC
ST

BLOCK



Appendix D

PARAMETER DATAFILE

The parameter datafile has the following format:

LINE 1:
- RNYR: Base year 1968 or extrapolation 1972.
- RN: Run number.
- LOC: Location of analysis.

LINE 2:
- NC: Credit form.

LINE 3:
- D1: Day of run.
- D2: Year of run.
- DT: Month of run.

LINE 4:
- K1: No. of gross income classes.
- K2: No. of property tax classes.
- K3: No. of income classes, old rate schedule.
- K4: No. of rate schedules.
- K5: No. of income classes, new rate schedule.

LINE 5:
- BCRED: Basic credit
- CRED: % property tax added to basic.
- ACRED: % assessment (not used).
- XINCP: % taxable income subtracted from credit.
- CMAX: Maximum credit.
- AMAS: Average assessment (not used).

LINE 6:
- EXEMS (1): Single exemption, old structure.
- EXEMS (2): Single exemption, new structure.
- EXEM (1): Married exemption, old structure.
- EXEM (2): Married exemption, new structure.

LINE 7:
- CH1: (not used).
- CH2: (not used).
- ECH1: children under 16 exemption.
- ECH2: children 16 and over exemption.

LINE 8:
- ARSH (1,J): Average rate schedule, old structure.

LINE 9:	ARSH (2,J):	Average rate schedule, new structure.
LINE 10:	BRSH (1,J):	Taxable income threshold, old structure.
LINE 11:	BRSH (2,J):	Taxable income threshold, new structure.
LINE 12:	RSH (1,J):	Marginal tax rate, old schedule.
LINE 13:	RSH (2,J):	Marginal tax rate, new schedule.
LINE 14,15:	SC, TXK:	Income classes (both identical, one now redundant).
LINE 16,17:	PKLAS, TP:	Property tax classes (both identical, one now redundant).

Appendix E

PARAMETER DATAFILE LISTING

The following is a sample listing of the parameter datafile described in Appendix D.

```
 TYPE FOR20.DAT
1968 203 G'LPH
1
17,1972,AUG
24,14,19,2,13
190,.10,1,.05,250.,0
1000,1500,2000,2850
0,0,300,550
0 134.55 150.0 278.57 351.50 586.60 842.30 1415.50 1951.10 2569.10
3290.10 4526.1 9161.1 16886.1 28216.1 46756.1 70188.6 142288.6 277476.1
0 110.5,227.5,474.5,734.5,1280.5,1878.5,2528.5,3230.5,4439.5
8989.5,16594.5,28333.5
0 909 1000 1643 2000 3000 4000 6000 8000 10000
12000 15000 25000 40000 60000 90000 125000 225000 400000
0,500,1000,2000,3000,5000,7000,9000,11000,14000
24000,39000,60000
.148 .17 .2 .2042 .2351 .2557 .2866 .2678 .3090 .3605
.412 .4635 .5150 .5665 .6180 .6695 .7210 .7725 .8240
.221,.234,.247,.260,.273,.299,.325,.351,.403,.455
.507,.559,.611
0,2500,3000,3500,4000,4500,5000,5500,6000,6500
7000,7500,8000,8500,9000,9500,10000,12000,15000,20000
25000,50000,100000,200000
0,2500,3000,3500,4000,4500,5000,5500,6000,6500
7000,7500,8000,8500,9000,9500,10000,12000,15000,20000
25000,50000,100000,200000
0,0,100,200,300,400,500,600,700,800
900,1000,1100,1200
0,0,100,200,300,400,500,600,700,800
900,1000,1100,1200
```

Appendix F

PROGRAM LISTING

```
XAAIN

C  GUELPH PROPERTY TAX ANALYZER
C
C
CLABEL MAIN
C
      COMMON/RSCH/ARSH( 3,30),BRSH( 3,30),RSH( 3,30)
      COMMON/CRED/BCRED,CRED,ACRED,XINCP,CMAX,AMAS
      COMMON/EX/EXEMS(2),EXEM(2)
      COMMON/CHILD/ECH1,ECH2
      COMMON/PROP/PKLAS(25),IP(25)
      COMMON/KLAS/XK(30),TXK(30)
      COMMON/LABEL/LOC,IYOB,SAM,SINNO,SUR,FNAME,ADD
      COMMON/INC/XLOS,XINC,XFOP,XDIV,XTOT
      COMMON/DED/DED,XMD,DON,EXEMP
      COMMON/PDATA/ASS,PROPT
      COMMON/TDATA/TAXI,FTAX,PTAX,FORT,PFTX,PFTX,STAX,TADJ,PAID,
     $CMBAL
        COMMON/K/K1,K2,K3,K4,K5,N1
        COMMON/SKL/S.(30,25),SOTAX(30,30),SNTAX(30,30),
     $ SCDO(30,30),SCDN(30,30),SN1(30,30),
     $ SIOT(30,30),SPROP(30,30)
        COMMON/CD/CDO,CDN
        COMMON/TX/TXN,TXO,NTAX,OTAX
        COMMON/NC/NC,KCH
        COMMON/EXC/SN,SO
        COMMON/ST/STXO(30,30),STXN(30,30)
        COMMON/DATE/D1,D2,DT,RN
        COMMON/COUNT/ NRIN,NRINX,NBAD,IEND
        COMMON/INPOUT/ INPT1,INPT2,IOUT1,IOUT2
        COMMON/FAM/ MSTA,CH1,CH2
        COMMON/SUM/SUMS(25)
        COMMON/DIVCD/ODIV(30),SDIV(30),XNDIV(30)
        COMMON/DSTOR/ STOR(3,30)
        COMMON/RECORD/MATCH(2080)
        COMMON/XKDS/ XCH1,XCH2
        COMMON/DCRED/ ODC,XNDC
        INTEGER CH1,CH2
C
      CALL PARAM
C
      CALL TAXANL
        CALL TAB1
        CALL TAB2
        CALL TAB3
        CALL TAB4
        CALL TAB5
        CALL TAB6
C
C
C
```

MAIN CONTINUED

```
      STOP
      END
.:
```

PARAM

```
      SUBROUTINE PARAM
C
CLABEL PARAM
C
C     TO READ PARAMETERS ASSUMPTIONS RATE SCHEDULES
C
C
      COMMON/RSCH/ARSH(3,30),BRSH(3,30),RSH(3,30)
      COMMON/CRED/BCRED,CRED,ACRED,XINCP,CMAX,AMAS
      COMMON/EX/EXEMS(2),EXEM(2)
      COMMON/CHILD/ECH1,ECH2
      COMMON/PROP/PKLAS(25),TP(25)
      COMMON/KLAS/XK(30),TXK(30)
        COMMON/K/K1,K2,K3,K4,K5,N1
        COMMON/NC/NC,KCH
        COMMON/DATE/D1,D2,DT,RN
        INTEGER CH1,CH2
        INPT=20
        IPOUT=6
   99 FORMAT(5I)
  100 FORMAT(6F)
  101 FORMAT(4F)
  103   FORMAT(I,G,A)
  104   FORMAT(10F)
105     FORMAT(I,I,A)
      READ(INPT,103) RNYR,RN,LOC
        READ(INPT,99) NC
        READ(INPT,105) D1,D2,DT
       READ(INPT,99) K1,K2,K3,K4,K5
      READ(INPT,100) BCRED,CRED,ACRED,XINCP,CMAX,AMAS
      READ(INPT,101) EXEMS(1),EXEMS(2),EXEM(1),EXEM(2)
      READ(INPT,101) CH1,CH2,ECH1,ECH2
        LL=K5
      DO 110 I=1,K4
        IF(I.EQ.1) K5=20
        READ(INPT,104) (ARSH(I,J),J=1,10)
      READ(INPT,104) (ARSH(I ,J),J=11,K5)
```

```
PARAM  CONTINUED


        IF(K5.NE.20)GOTO111
        READ(INPT,104) (ARSH(I,J),J=21,K3)
        K5=LL
  111   CONTINUE
  110   CONTINUE
      DO 112 I=1,K4
        IF(I.EQ.1)K5=20
        READ(INPT,104) (BRSH(I,J),J=1,10)
      READ(INPT,104) (BRSH(I,J),J=11,K5)
        IF(K5.NE.20)GOTO113
        READ(INPT,104) (BRSH(I,J),J=21,K3)
        K5=LL
  113   CONTINUE
112     CONTINUE
      DO 114 I=1,K4
        IF(I.EQ.1)K5=20
        READ(INPT,104) (RSH(I,J),J=1,10)
      READ(INPT,104) (RSH(I,J),J=11,K5)
        IF(K5.NE.20)GOTO115
        READ(INPT,104) (RSH(I,J),J=21,K3)
        K5=LL
  115   CONTINUE
 114    CONTINUE
        READ(INPT,104) (XK(I),I=1,10)
        READ(INPT,104) (XK(I),I=11,20)
        READ(INPT,104) (XK(I),I=21,K1)
        READ(INPT,104) (TXK(I),I=1,10)
        READ(INPT,104) (TXK(I),I=11,20)
        READ(INPT,104) (TXK(I),I=21,K1)
        READ(INPT,104) (PKLAS(I),I=1,10)
        READ(INPT,104) (PKLAS(I),I=11,20)
        IF(K2.LE.20)GOTO70
        READ(INPT,104) (PKLAS(I),I=21,K2)
  70    CONTINUE
        READ(INPT,104) (TP(I),I=1,10)
        READ(INPT,104) (TP(I),I=11,20)
        IF(K2.LE.20)GOTO80
        READ(INPT,104) (TP(I),I=21,K2)
  80    CONTINUE
 119    FORMAT(1H1)
 120 FORMAT(23X,28HGUELPH PROPERTY TAX ANALYZER)
 121 FORMAT(21X,36HDEPARTMENT OF TREASURY AND ECONOMICS)
 122 FORMAT(28X,21HGOVERNMENT OF ONTARIO)
 123    FORMAT(28X,'TAX AND FISCAL POLICY')
 124 FORMAT(34X,6HBRANCH)
 125 FORMAT(///)
 126  FORMAT(1X,9HLOCATION:,2X,A5,13X,11HRUN NUMBER:,F4.0)
 127    FORMAT(1X,'RUN DATE:',A5,1X,I2,',',1X,I4,
     $ 6X,'RUN YEAR:',5X,I4)
 128    FORMAT(1X,'RATE SCHEDULE')
```

PARAM CONTINUED

```
  129 FORMAT(3X,18HOLD RATE SCHEDULE:)
  130 FORMAT(9X,9HBOTTOM OF,7X,7HAVERAGE,8X,8HMARGINAL)
  131 FORMAT(9X,5HCLASS,11X,4HRATE,11X,4HRATE)
  132 FORMAT(3X,18HNEW RATE SCHEDULE:)
  133 FORMAT(3X,21HPROPERTY TAX CLASSES:)
  134 FORMAT(9X,9HTHRESHOLD)
  135 FORMAT(9X,8HOF CLASS)
  136 FORMAT(3X,15HINCOME CLASSES:)
  137 FORMAT(9X,F10.2,5X,F10.2,5X,F10.2)
  138 FORMAT(9X,F10.2)
  139 FORMAT(/)
  140 FORMAT(3X,32HPROPERTY TAX CREDIT ASSUMPTIONS:,//)
  141 FORMAT(9X,13HBASIC CREDIT:,12X,F8.3,/)
  142 FORMAT(9X,25HCREDIT AS % PROPERTY TAX:,F8.3,/)
  143 FORMAT(9X,25HCREDIT AS % ASSESSMENT  :,F8.3,/)
  144 FORMAT(9X,25HCREDIT AS % INCOME      :,F8.3,/)
  145 FORMAT(9X,25HMAXIMUM CREDIT AVAILABLE:,F8.3,/)
  146 FORMAT(9X,25HAVERAGE ASSESSMENT      :,F8.3,////)
147   FORMAT(9X,5HLOWER)
C
C     WRITE PARAMETERS
C
      WRITE(IPOUT,120)
      WRITE(IPOUT,121)
      WRITE(IPOUT,122)
      WRITE(IPOUT,123)
      WRITE(IPOUT,124)
      WRITE(IPOUT,125)
      WRITE(IPOUT,126),LOC,RN
        WRITE(IPOUT,127) DT,D1,D2,RNYR
      WRITE(IPOUT,125)
      WRITE(IPOUT,128)
      WRITE(IPOUT,139)
      WRITE(IPOUT,129)
      WRITE(IPOUT,139)
      WRITE(IPOUT,130)
      WRITE(IPOUT,131)
        I=1
      DO 150 J=1,K3
  150 WRITE(IPOUT,137),BRSH(I,J),ARSH(I,J),RSH(I,J)
      IF(K4.LE.1)GOTO170
        WRITE(IPOUT,119)
      WRITE(IPOUT,125)
      WRITE(IPOUT,132)
      WRITE(IPOUT,139)
      WRITE(IPOUT,130)
      WRITE(IPOUT,131)
        I=2
      DO 160 J=1,K5
  160 WRITE(IPOUT,137),BRSH(I,J),ARSH(I,J),RSH(I,J)
```

PARAM CONTINUED

```
  170 CONTINUE
        WRITE(IPOUT,119)
      WRITE(IPOUT,125)
      WRITE(IPOUT,133)
      WRITE(IPOUT,139)
        WRITE(IPOUT,147)
      WRITE(IPOUT,134)
      WRITE(IPOUT,135)
      DO 180 I=1,K2
  180 WRITE(IPOUT,138),PKLAS(I)
        WRITE(IPOUT,119)
      WRITE(IPOUT,125)
      WRITE(IPOUT,136)
      WRITE(IPOUT,139)
        WRITE(IPOUT,147)
      WRITE(IPOUT,134)
      WRITE(IPOUT,135)
      WRITE(IPOUT,139)
      DO 190 I=1,K1
  190 WRITE(IPOUT,138),TXK(I)
        WRITE(IPOUT,119)
C
      WRITE(IPOUT,125)
      WRITE(IPOUT,140)
      WRITE(IPOUT,141),BCRED
      WRITE(IPOUT,142),CRED
      WRITE(IPOUT,143),ACRED
      WRITE(IPOUT,144),XINCP
      WRITE(IPOUT,145),CMAX
      WRITE(IPOUT,146),AMAS
      WRITE(IPOUT,125)
        WRITE(IPOUT,119)
C
C
      RETURN
      END
```

READTP

```
      SUBROUTINE READIN
C   TO READ IN RECORDS FROM GUELPH MATCH TAPES.
C   READS IN 10 RECORDS AT A TIME.
```

READTP CONTINUED

```
C   WRITTEN BY HARRY NEWTON.   OCTOBER 1971.
      COMMON/COUNT/NRIN,NRINX,NBAD,IEND
      COMMON/RECORD/MATCH(2080)
      COMMON/INPOUT/INPT1,INPT2,IOUT1,IOUT2
      DATA ISW/0/
      DATA NRIN/0/,NRINX/0/,NBAD/0/,IEND/0/
      IF(ISW.EQ.1) GO TO 100
      CALL NTRAN(INPT1,12)
      CALL NTRAN(INPT1,14)
        TYPE 150
150     FORMAT(/,2X,'TYPE NO. OF RECORDS TO BE PROCESSED-',$)
        ACCEPT 151,MAXREC
151    FORMAT (IG)
      ISW=1
  100 NRIN=NRIN+10
        IF(MOD(NRIN,1000).EQ.0) TYPE 151,NRIN
C   READ INPUT RECORD.
  200 CALL NTRAN(INPT1,2,2080,MATCH,IST)
  201 IF(IST.EQ.-1) GO TO 201
      IF(IST.EQ.-2) GO TO 500
      IF(IST.LE.-3) GO TO 400
        IF(NRIN.GT.MAXREC.AND.MAXREC.NE.0) GO TO 500
      RETURN
C   INPUT ERROR-RECORD UNREADABLE.  TRY TO READ ANOTHER RECORD.
  400 NBAD=NBAD+10
        TYPE149,IST,NRIN,NBAD
149      FORMAT(2X,'ERROR-IST=',I5,6X,'NRIN=',I6,6X,'NBAD='
     &  ,I6,6X,'UNIT RE-ENABLED')
        CALL NTRAN(INPT1,22)
      GO TO 200
C   END-OF-TAPE.  RETURN TO CALLING PROGRAM.
  500 NRIN=NRIN-10
  600 IEND=1
      RETURN
      END
      SUBROUTINE ATTACH(I)
C   THIS SUBROUTINE ATTACHES PROGRAM VARIABLE NAMES TO THE APPROPRIATE
C   ELEMENTS OF THE INPUT ARRAY.
C   WRITTEN BY HARRY NEWTON.  OCTOBER 1971.
      COMMON/RECORD/MATCH(2080)
        COMMON/DSTOR/ STOR(3,30)
        COMMON/COUNT/NRIN,NRINX,NBAD,IEND
      DATA NNEG/0/
      IF(I.GT.10.OR.I.LT.1) GO TO 100
        STOR(1,7)=MATCH(208*(I-1)+7)
        STOR(1,8)=MATCH(208*(I-1)+8)
        STOR(1,9)=MATCH(208*(I-1)+9)
        STOR(1,20)=MATCH(208*(I-1)+18)
        STOR(1,21)=MATCH(208*(I-1)+25)
        STOR(1,22)=MATCH(208*(I-1)+26)
```

```
READTP CONTINUED

          STOR(1,23)=MATCH(208*(I-1)+27)
          STOR(1,10)=MATCH(208*(I-1)+123)
          STOR(1,11)=MATCH(208*(I-1)+131)
          STOR(1,1)=MATCH(208*(I-1)+132)
          STOR(1,12)=MATCH(208*(I-1)+133)
          STOR(1,13)=MATCH(208*(I-1)+134)
        STOR(1,2)=MATCH(208*(I-1)+135)
        IF(STOR(1,2).LT.0.) NNEG=NNEG+1
        STOR(1,3)=MATCH(208*(I-1)+137)
        STOR(1,4)=MATCH(208*(I-1)+138)
        STOR(1,5)=MATCH(208*(I-1)+143)
          STOR(1,6)=MATCH(208*(I-1)+144)
          STOR(1,14)=MATCH(208*(I-1)+146)
          STOR(1,15)=MATCH(208*(I-1)+147)
          STOR(1,16)=MATCH(208*(I-1)+149)
          STOR(1,17)=MATCH(208*(I-1)+151)
          STOR(1,18)=MATCH(208*(I-1)+152)
          STOR(1,19)=MATCH(208*(I-1)+153)
          STOR(1,24)=MATCH(208*(I-1)+14)
101     FORMAT(2X,'RECS.READ',I6,3X,'I',I6)
          RETURN
  100 WRITE(6,200) I,NRIN
  200 FORMAT(33H0ERROR IN SUBROUTINE ATTACH -- I=,I6,15X,5HNREC=,I6)
      RETURN
      END
.!END




XTAXA

        SUBROUTINE TAXANL
C
CLABEL TAXANL
C
        COMMON/LABEL/LOC,IYOB,SAM,SINNO,SUR,FNAME,ADD
        COMMON/INC/XLOS,XINC,XFOR,XDIV,XTOT
        COMMON/DED/DDD,XMD,DON,EXEMP
        COMMON/PDATA/ASS,PROPT
        COMMON/TDATA/TAXI,FTAX,PTAX,FORT,FFIX,PFTX,STAX,TADJ,
     $ CM3L
        COMMON/NC/NC,KCH
        COMMON/KK/K1,K2,K3,K4,K5,N1
        COMMON/PW/KLAS(25),TP(25)
        COMMON/KLAS/XK(30),TXK(30)
```

XTAXA CONTINUED

```
      COMMON/SKL/ SM(30,25),SOTAX(30,34),SNTAX(30,30),
     $ SCDO(30,30),SCDN(30,30),SN1(30,30),SIOT(30,30),SPROP(30,34)
      COMMON/ST/ STXO(30,30),STXN(30,34)
      COMMON/COUNT/ NRIN,NRINX,NBAD,IEND
      COMMON/INPOUT/ INPT1,INPT2,IOUT1,IOUT2
      COMMON/FAM/ MSTA,CH1,CH2
      COMMON/CHILD/ECH1,ECH2
      COMMON/SUM/SUMS(25)
      COMMON/DIVCD/ODIV(30),SDIV(30),XNDIV(30)
      COMMON/DSTOR/ STOR(3,30)
      COMMON/RECORD/MATCH(2080)
      COMMON/XKDS/ XCH1,XCH2
      COMMON/DCRED/ ODC,XNDC
      INTEGER CH1,CH2
      REAL MR
      DATA STOR/90*0/
      DATA INPT1/12/,INPT2/0/,IOUT1/0/,IOUT2/6/
      ID1=24
C
C
C
      IEXTRP=1
C
C
      B=B+1
24     I=0
      CALL READIN
      IF(IEND.EQ.1) GO TO 5000
4     I=I+1
      IF(STOR(2,7).NE.0) GO TO 5
      IF(STOR(2,7).NE.0)GOTO5
      IF(STOR(2,9).EQ.9)GO TO 5000
C
      IF(I.GT.10)GO TO 20
      CALL ATTACH(I)
      IF(STOR(1,9).EQ.9) GO TO 5000
C
C
      DO 25 IJ=1,ID1
      STOR(2,IJ)=STOR(1,IJ)
      STOR(1,IJ)=0
25     CONTINUE
7     CONTINUE
C
C
      I=I+1
5     CONTINUE
      IF(I.GT.10)GOTO20
      IF(STOR(2,9).EQ.9) GO TO 5000
C
```

YLAXA CONTINUED

```
      CALL ATTACH(1)
C
C
      DO 6 J=7,9
      IF(STOR(1,J).NE.STOR(2,J)) GOTO 8
6     CONTINUE
      IF(STOR(1,24).NE.STOR(2,24)) GO TO 8
      IF(STOR(2,2).LE.STOR(1,2)) GO TO9
      DO 32 IJ=1,ID1
      STOR(1,IJ)=0
32    CONTINUE
      GO TO 7
8     CONTINUE
C
C
C
      DO 33 IK=1,ID1
      STOR(3,IK)=STOR(1,IK)
      STOR(1,IK)=STOR(2,IK)
      STOR(2,IK)=STOR(3,IK)
      STOR(3,IK)=0
33    CONTINUE
      GO TO 10
C
C
9     CONTINUE
      DO 37 IJ=1,ID1
      STOR(2,IJ)=STOR(1,IJ)
      STOR(1,IJ)=0
37    CONTINUE
      GO TO 7
C
C
10     CONTINUE
      XINC=STOR(1,1)
      XTOT=STOR(1,2)
      DED=STOR(1,3)
      XMD=STOR(1,4)
      DON=STOR(1,5)
      EXEMP=STOR(1,6)
      IYOB=STOR(1,10)
      XLOS=STOR(1,11)
      SFOR=STOR(1,12)
      XDIV=STOR(1,13)
      TAXI=STOR(1,14)
      FTAX=STOR(1,15)
      PTAX=STOR(1,16)
      FFOR=STOR(1,17)
      FFTX=STOR(1,18)
      PFTX=STOR(1,19)
```

```
XTAXA  CONTINUED

        PCLAS=STOR(1,20)
        XLAND=STOR(1,21)
        BUILD=STOR(1,22)
        BUSPC=STOR(1,23)
C
C
C
        IF(IYOB.EQ.0) GO TO 92
        IYR=MOD(IYOB,100)
        IF(IYR.GT.0.AND.IYR.LT.10)IYR=MOD(IYOB,1000)
        IF(IYR.GT.100)IYR=MOD(IYR,100)
C
        IYOB=IYR
        IF(IYOB.LE.69.AND.IYOB.GE.04) GO TO 92
      IF(NRIN.LE.30)    TYPE3,IYOB
42     FORMAT(3X,4(F15.4))
3       FORMAT(3X,'YEAR OF BIRTH',I6)
11       FORMAT(3X,'DIVIDENDS',F10.2)
78     CONTINUE
2      FORMAT(//,5X,'X0X')
        DO 34 IJ=1,ID1
34      STOR(1,IJ)=0
        CALL ADJ
C
C
C
        CALL RATESH
        IF(PCLAS.LT.1) TYPE2
        MR=.0277
        IF(PCLAS.EQ.1) MR=.0277
        IF(PCLAS.EQ.2) MR=.02470
        IF(PCLAS.GT.2) MR=.0277
        IF(BUSPC.NE.0)BUS=BUS+1
1      FORMAT(3X,'TINC',F10.0,'ASS',F12.0)
C
        BUILD=XLAND+BUILD
        IF(IEXTRP.NE.2) GO TO 143
        BUILD =BUILD*1.1102
        BUILD=BUILD*1.18893
143     CONTINUE
        PROPT=MR*BUILD
        IF(NRIN.GT.100) GO TO 79
79     CONTINUE
        CALL CREDIT
131    FORMAT(1X,2I10)
        CALL ACCUM
92     CONTINUE
        GO TO 4
 5000   CONTINUE
        DO  5020  J=1,X2
```

XTAXA CONTINUED

```
          DO 5010 I=1,K1
          SOTAX(K1+1,J)=SOTAX(K1+1,J)+SOTAX(I,J)
          SNTAX(K1+1,J)=SNTAX(K1+1,J)+SNTAX(I,J)
          SCDO(K1+1,J) =SCDO(K1+1,J) +SCDO(I,J)
          SCDN(K1+1,J) =SCDN(K1+1,J) +SCDN(I,J)
          SN1(K1+1,J) =SN1(K1+1,J) +SN1(I,J)
          SIOT(K1+1,J)=SIOT(K1+1,J) +SIOT(I,J)
          SPROP(K1+1,J)=SPROP(K1+1,J) +SPROP(I,J)
          STXO(K1+1,J)= STXO(K1+1,J) +STXO(I,J)
          STXN(K1+1,J)=STXN(K1+1,J) +STXN(I,J)
5010    CONTINUE
5020    CONTINUE
          DO 640 J=1,23
          DO 625 I=1,K1
          SUMS(J)=SM(I,J)+SUMS(J)
625       CONTINUE
640       CONTINUE
C
          RETURN
          END
.K
```

XADJ

```
      SUBROUTINE ADJ
C
C
C     TO ESTIMATE DEPENDENCY CHARACTERISTICS
C
      COMMON/LABEL/LOC,IYOB,SAM,SINNO,SUR,FNAME,ADD
      COMMON/DED/DED,XMJ,DON,EXEMP
      COMMON/INC/XLOS,XINC,XFOR,XDIV,XTOT
      COMMON/PDATA/ASS,PROPT
      COMMON/TDATA/TAXI,FTAX,PTAX,FORT,FFTX,PFTX,STAX,TADJ,PAID,
     $CMBAL
        COMMON/TX/TXN,TXO,NTAX,OTAX
        COMMON/NC/NC,KCH
        COMMON/EXC/SN,SO
        COMMON/CD/CDO,CDN
        COMMON/K/K1,K2,K3,K4,K5,N1
        COMMON/KLAS/XK(30),TXK(30)
        COMMON/EX/EXS(2),EXFM(2)
        COMMON/CHILD/ECH1,ECH2
```

XAEJ CONTINUED

```
      COMMON/PROP/PKLAS(25),TP(25)
      COMMON/FAM/ MSTA,CH1,CH2
      COMMON/COUNT/ NRIN,NRINX,NBAD.IEND
      COMMON/XKDS/ XCH1,XCH2
      COMMON/DCRED/ ODC,XNDC
      INTEGER XMSTA,XMSTO,AGE,CH1,CH2
      DATA SW1/0/
      DIMENSION XMSTO(21)
      DIMENSION XODED(21),KD1(21),KD2(21),AGE(21)
      DIMENSION XDED(40),MCH1(40),MCH2(40),XMSTA(40)
      DATA ERM/5./
      DATA XDED/1000..1300.,1550.,1600..1850..1900..
     $ 2000.,2100.,2150..2200.,2300.,2400.,2450.,
     $2500..2550.,2600..2650.,2700..2800..2850..2900.,
     $ 2950..3100..3150.,3200.,3250..3400.,
     $ 3450.,3500..3550..3650.,3700..3800..3850..3950..4100..
     $ 4200.,4250.,4500.,4550./
      DATA MCH1/0,1,0,2,1,3,0,0,2,4,1,1,3.5,0,2,0,2.6,
     $ 1.3,1,0,2,4,2,1,3.5,3,0,2,6,4,1,7.4,2,1.3/
      DATA MCH2/0,0,1,0,1,0,0,2,1,0,0,2,1,0,1,0,3,2,0,1.0,3,2,1.0,3,2,
     $ 1,0,3,3,2,0,3,3,0,0,3,4,3/
      DATA XMSTA/1,1,1,1,1,1,2,1,1,1,2,1,1,1,2,2,1,1,1,
     $ 2,2,1,2,2,2,1,2,2,2,1,2,2,2,1,2,2,2,2,2,2/
      DATA XODED/1000.,1300.,1500.,1800..1850.,2000..2050.,2150..
     $ 2300..2500., 2650..2800.,2900..3000..3200..3300.,3550..3850..
     $ 4700..5000.,5700./
      DATA KD1 /0,1,0,1,1,0,0,2,1,0,2,1,1,0,2,1,0,1,2,3,3/
      DATA KD2 /0,0,0,0,1,0,1,0,0,0,1,0,2,0,2,0,1,1,2,2,3/
      DATA AGE /0,0,1,1,0,0,1,0,0,1,1,1,1,2,1,2,2,2,2,2,2/
      DATA XMSTO /1,1,1,1,1,1,2,1,1,2,2,1,2,1,2,1,2,2,2,2,2,2/
C
C
C
C
C
C
C     ANALYSIS OF THE DIVIDEND TAX CREDIT UNDER THE OLD AND
C     NEW SYSTEMS.  JAN. 17,1972
C
C
      ODC=XDIV*.2
      BAD=XDIV*.33333
C
C
      XINC=XTOT+BAD
      XNDC=BAD*.8
      XNDC=XNDC+XNDC*.30
C
      XNTR=1.
```

XADJ CONTINUED

```
C
C
        IEXTRP=1
C      IEXTRP =  THE EXTRAPOLATION SWITCH
C        IF IEXTRP =2  EXTRAPOLATION IS TO 1972
C        IF IEXTRP =3  IT IS TO 1973
        IF(IEXTRP.NE.2) GO TO 120
        XNTR=1.18893
        XTOT=XTOT*1.44717
        DON=DON*1.18893
        XMD=XMD*1.18893
        DED=DED*1.18893
        XINC=XINC*1.44717
        XNDC=XNDC*1.44717
        ODC=ODC*1.44717
120     CONTINUE
        IF(IYOB.GT.98.OR.IYOB.LE.71)GOTO480
        DO 410 J=1,21
        IF(EXEMP.GT.(XODED(21)+ERM)) GO TO 420
        IF(EXEMP.LT.(XODED(J)+ERM))  GO TO 419
410     CONTINUE
419     CONTINUE
469     FORMAT(3X,'"J"-OLD MAX',I5)
470     FORMAT(3X,'"J"',I5)
471     FORMAT(3X,'YOUNG J',I5)
C
C
        XCH1=KD1(J)
        XCH2=KD2(J)
        MSTA=XMST0(J)
        ADED=AGE(J)
        ADED=ADED*XNTR
        GO TO 425
C
C
C
420     XCH1=4
        XCH2=4
        MSTA=2
        ADED=2
C
425     CONTINUE
C
        IF(IEXTRP.NE.2) GO TO 125
        XCH1=XCH1*XNTR
        XCH2=XCH2*XNTR
125     CONTINUE
C
C      OLD TAX ACT
        SO=XCH1*ECH1+XCH2*ECH2
```

```
YADJ    CONTINUED

          IF(MSTA.EQ.2) GO TO 430
          SO=SO+XNTR*EXEMS(1)
          GO TO 431
430      SO=SO+XNTR*EXEM(1)
431      CONTINUE
          SO=SO+ADED*500.
C
C
C       NEW BILL
C
C
          SN=XCH1*ECH1+XCH2*ECH2
          IF(MSTA.EQ.2) GO TO 435
          SN=SN+XNTR*EXEMS(2)
          GO TO 436
435      CONTINUE
          SN=SN+XNTR*EXEM(2)
436       CONTINUE
          SN=SN+ADED*650.
          GO TO 490
480      CONTINUE
C
C
C
334      CONTINUE
          DO 340 J=1,40
          IF(EXEMP.GT.(XDED(40)+ERM))GO TO 346
          IF(EXEMP.LT.(XDED(J)+ERM)) GO TO 345
340      CONTINUE
C
C
345     XCH1=MCH1(J)
          XCH2=MCH2(J)
          MSTA=XMSTA(J)
          GO TO 347
346      XCH1=(EXEMP-2000.)/850.
          XCH2=XCH1
          TYPE469,J
          MSTA=2
347     CONTINUE
C
          IF(IEXTRP.NE.2) GO TO 126
          XCH1=XCH1*XNTR
          XCH2=XCH2*XNTR
126       CONTINUE
C
C
C
C         OLD TAX ACT
C
```

XADJ CONTINUED

```
C
        SO=XCH1*ECH1+XCH2*ECH2
        IF(MSTA.EQ.2)GOTO355
        SO=XNTR*EXEMS(1)+SO
        GO TO 357
355     SO=XNTR*EXEM(1)+SØ
357    CONTINUE
C
C
C
C       NEW BILL
C
C
C
        SN=XCH1*ECH1+XCH2*ECH2
        IF(MSTA.EQ.2)GO TO 365
        SN=XNTR*EXEMS(2)+SN
        GO TO 367
365     SN=XNTR*EXEM(2)+SN
        IF(IYOB.LT.4.AND.IYOB.GT.98)SN=XNTR*650*MSTA+SN
367    CONTINUE
490     CONTINUE
C
C
        OTAX=XIOT-SO
        OTAX=OTAX-DON-XMD-DED
        IF(OTAX.LE.Ø) OTAX=Ø
C
C
        NTAX=XINC-SN
        NTAX=NTAX-DON-XMD-DED
        IF(NTAX.LE.Ø) NTAX=Ø
C
C
        IF(NRIN.GT.100) GO TO 200
200     CONTINUE
5       FORMAT(3X,'KIDS',F10.2)
        RETURN
        END
.
.
```

XCRED

```
      SUBROUTINE CREDIT
C
C
        COMMON/CRED/BCRED,CRED,ACRED,XINCP,CMAX,AMAS
        COMMON/NC/NC,KCH
        COMMON/CD/CDO,CDN
        COMMON/TX/TXN,TXO,NTAX,OTAX
        COMMON/FAM/ MSTA,CH1,CH2
        COMMON/COUNT/ NRIN,NRINX,NBAD,IEND
        COMMON/PDATA/ASS,PROPT
        COMMON/XKDS/ XCH1,XCH2
C
        INTEGER CH1,CH2
        IPOUT=6
C
C
  501 CONTINUE
C
  520 FORMAT(3X,27HPROPERTY CREDIT NOT DEFINED)
  521 FORMAT(3X,30HANALYSIS NOW ASSUMES OPTION #2)
C
      IF(NC.NE.1)GOTO510
        BB=0
        XZ=0
        XZ=BCRED
        IF(PROPT.LE.BCRED) XZ=PROPT
        GO TO 600
C     IF 'GO TO 600' ABOVE SALES TAX CREDIT SURPRSSED
        IF(MSTA.EQ.2) BB=10.*2.
        IF(MSTA.NE.2) BB=10.*1.
        BB=BB+10.*XCH1+10.*XCH2
        XY1=BB-XINCP*OTAX
        XY2=BB-XINCP*NTAX
        IF(XY1.LE.0)XY1=0
        IF(XY2.LE.0)XY2=0
600     CONTINUE
      CDO=XZ+CRED*PROPT-XINCP*OTAX
      CDN=XZ+CRED*PROPT-XINCP*NTAX
        IF(CDO.LE.AMAS)CDO=AMAS
        IF(CDN.LE.AMAS)CDN=AMAS
        IF(CDN.GT.CMAX) CDN=CMAX
        IF(CDO.GT.CMAX) CDO=CMAX
        CDO=CDO+XY1
        CDN=CDN+XY2
      GOTO550
  510 IF(NC.NE.2)GOTO511
      CDO=BCRED+CRED*PROPT
      CDN=CDO
      GOTO550
  511 IF(NC.NE.3)GOTO512
```

XCRED CONTINUED

```
      CDO=BCRED-XINCP*OTAX
      CDN=BCRED-XINCP*NTAX
        GOTO550
  512 WRITE(IPOUT,520)
      WRITE(IPOUT,521)
      NC=2
        GOTO501
  550   CONTINUE
        IF(CDO.LE.150) GO TO 556
  551   FORMAT(3X,'XY!',F10.2)
  552   FORMAT(3X,'AMAS=',F10.2)
  553   FORMAT(3X,'CREDIT=',F10.2)
  554   FORMAT(3X,'PROPT=',F10.2)
  555    FORMAT(3X,'BAD EST OF CRED',F12.2,6X,'AT REC NO.',
     $ I8)
  560   FORMAT(3X,'XYZ=',F10.2)
  561    FORMAT(3X,'MSTA=',I2)
         TYPE553,CDN
         TYPE554,PROPT
  557    FORMAT(3X,'NEW ASSUMED VALUE OF CRDIT',F12.2)
  556    CONTINUE
      RETURN
      END
.SAV
```

RSCH

```
      SUBROUTINE RATESH
C
C
        COMMON/TX/TXN,TXO,NTAX,OTAX
        COMMON/K/K1,K2,K3,K4,K5,N1
        COMMON/RSCH/ARSH(3,30),BRSH(3,30),RSH(3,30)
        COMMON/INC/XLOS,XINC,XFOR,XDIV,XTOT
        COMMON/DCRED/ ODC,XNDC
C
      TXO=0
      TXN=0
      TXY=0
      TX=0
C
       DO 499 I=1,K4
       IF(I.EQ.2)TXY=NTAX
```

RSCH CONTINUED

```
      IF(I.EQ.1)TXY=OTAX
C
      IF(I.EQ.1)NJ=K3
      IF(I.EQ.2)NJ=K5
C
      DO 498 J=1,NJ
        IF(J.EQ.NJ)GOTO405
      IF(TXY.GE.BRSH(I,J+1))GOTO410
  405 CONTINUE
      TX=(TXY-BRSH(I,J))*RSH(I,J)
       TX=TX+ARSH(I,J)
      GOTO420
  410  CONTINUE
  498 CONTINUE
C
  420 CONTINUE
       IF(I.NE.1) GO TO 450
       TXO=TX
       TXO=TXO-ODC
       IF(TXO.LE.0) TXO=0
       GO TO 499
450    CONTINUE
       TXN=TX
       TXN=TXN-XNDC
       IF(TXN.LE.0) TXN=0
  499 CONTINUE
      RETURN
      END
.*END
```

XACUM

```
      SUBROUTINE ACCUM
C
C
      COMMON/LABEL/LOC,IYOB,SAM,SINNO,SUR,FNAME,ADD
      COMMON/INC/XLOS,XINC,XFOR,XDIV,XTOT
      COMMON/DED/DED,XMD,DON,EXEMP
      COMMON/PDATA/ASS,PROPT
      COMMON/TDATA/TAXI,FTAX,PTAX,FORT,FFTX,PFTX,STAX,TADJ,PAID,
     $CMBAL
        COMMON/CD/CDO,CDN
        COMMON/TX/TXN,TXO,NTAX,OTAX
```

XACUM CONTINUED

```
      COMMON/NC/NC,KCH
      COMMON/EXC/SN,SO
      COMMON/K/K1,K2,K3,K4,K5,N1
     $ SCDO(30,30),SCDN(30,30),SN1(30,30),SIOT(30,30),SPROP(30,30)
      COMMON/ST/STXO(30,30),STXN(30,30)
      COMMON/KLAS/XK(30),TXK(30)
      COMMON/PROP/PKLAS(25),IP(25)
      COMMON/FAM/ MSTA,CH1,CH2
      COMMON/SUM/SUMS(25)
      COMMON/DIVCD/ ODIV(30),SDIV(30),XNDIV(30)
      COMMON/XKDS/ XCH1,XCH2
      COMMON/DCRED/ ODC,XNDC
      INTEGER CH1,CH2
      XX=0
      XY=0
      XX=XCH1
      XY=XCH2
      XNTR=1.
      IEXTRP=1
      IF(IEXTRP.NE.2) GO TO 690
      XNTR=1.18893
      XIOT=XIOT/XNTR
  690 CONTINUE
C
      DO 620 I=1,K1
        IF(XIOT.GE.TXK(I+1))GOTO615
      IJ=I
        GOTO621
C
  615 CONTINUE
        IF(XIOT.GE.TXK(K1))IJ=K1
  620 CONTINUE
  621   CONTINUE
C
C
        IF(IEXTRP.NE.2) GO TO 692
        XIOT=XIOT*XNTR
  692   CONTINUE
        SM(IJ,1)=XIOT+SM(IJ,1)
      SM(IJ,2)=DED +SM(IJ,2)
      SM(IJ,3)=XMD +SM(IJ,3)
      SM(IJ,4)=DON +SM(IJ,4)
      SM(IJ,5)=EXEMP+SM(IJ,5)
      SM(IJ,6)=SN  +SM(IJ,6)
      SM(IJ,7)=SO  +SM(IJ,7)
      SM(IJ,8)=TAXI+SM(IJ,8)
      SM(IJ,9)=OTAX+SM(IJ,9)
      SM(IJ,10)=NTAX+SM(IJ,10)
      SM(IJ,11)=FTAX+SM(IJ,11)
```

XACUM CONTINUED

```
      SM(IJ,12)=PTAX+SM(IJ,12)
      SM(IJ,13)=FFTX+SM(IJ,13)
      SM(IJ,14)=PFTX+SM(IJ,14)
      SM(IJ,15)=TXO +SM(IJ,15)
      SM(IJ,16)=TXN +SM(IJ,16)
      SM(IJ,17)=CDO +SM(IJ,17)
      SM(IJ,18)=CDN +SM(IJ,18)
      SM(IJ,19)=PROPT+SM(IJ,19)
      SM(IJ,20)=SM(IJ,20)+ASS
      SM(IJ,21)=SM(IJ,21)+1
        SM(IJ,22)=SM(IJ,22)+XX
        SM(IJ,23)=SM(IJ,23)+XY
        IF(MSTA.EQ.1) SM(IJ,24)=SM(IJ,24)+XNTR
        IF(MSTA.EQ.2) SM(IJ,25)=SM(IJ,25)+XNTR
        ODIV(IJ)  = ODIV(IJ)+ODC
        XNDIV(IJ) = XNDIV(IJ)+XNDC
        SDIV(IJ)  = SDIV(IJ) +XDIV
C
C
        IF(IEXTRP.NE.2) GO TO 695
        PROPT=PROPT/XNTR
695   CONTINUE
        DO 630 I=1,K2
        IF(I.EQ.K2)GOTO633
        IF(PROPT.GE.TP(I+1))GOTO633
        IK=I
        GOTO631
 633    CONTINUE
        IF(PROPT.GE.TP(K2))IK=K2
 630    CONTINUE
C
 631   CONTINUE
        IF(IEXTRP.NE.2) GO TO 696
        PROPT=PROPT*XNTR
696    CONTINUE
C
C
        SOTAX(IJ,IK)=SOTAX(IJ,IK) +OTAX
        SNTAX(IJ,IK)=SNTAX(IJ,IK) +NTAX
        SCDO(IJ,IK) =SCDO (IJ,IK) +CDO
        SCDN(IJ,IK) =SCDN(IJ,IK) +CDN
        SNI(IJ,IK)  =SNI(IJ,IK) +XNTR
        STOT(IJ,IK) =STOT(IJ,IK) +XTOT
        SPROP(IJ,IK) =SPROP(IJ,IK) +PROPT
        STXO(IJ,IK)=STXO(IJ,IK)+TXO
        STXN(IJ,IK)=STXN(IJ,IK)+TXN
C
C
C
        RETURN
```

```
XACUM  CONTINUED

       END
```

```
TAB1

       SUBROUTINE TAB1
       COMMON/SKL/SM(30,25),SOTAX(30,30),SNTAX(30,30),
     $SCDO(30,30),SCDN(30,30),SN1(30,30),
     $ STOT(30,30),SPROP(30,30)
       COMMON/ST/STXO(30,30),STXN(30,30)
       COMMON/K/K1,K2,K3,K4,K5,N1
       COMMON/PROP/PKLAS(25),TP(25)
       COMMON/KLAS/XK(30),TXK(30)
       COMMON/DATE/ D1,D2,DT,RN
C
C
C
       IPOUT=6
       DIMENSION STB(30,30)
       DO4050 IT=1,4
       IF(IT.LE.1)GOTO4010
       IF(IT.LE.2)GOTO4011
       IF(IT.LE.3)GOTO4012
       IF(IT.LE.4)GOTO4013
 4059  FORMAT(85X,'DATE OF RUN:',1X,A5,I2,',',1X,I4)
 4060  FORMAT(1H1)
 4061  FORMAT(1H-)
 4062  FORMAT(3X,44H NUMBER OF TAX FILERS IN EACH PROPERTY CLASS)
4063  FORMAT(3X,' ==========================================')
4064  FORMAT(3X,'TOTAL INCOME IN EACH PROPERTY CLASS')
4065  FORMAT(11(3X,7H-------))
 4066  FORMAT(3X,F7.0,10(F10.1))
 4067  FORMAT(3X,'==========================================')
4068  FORMAT(3X,'AVERAGE GROSS INCOME IN EACH PROPERTY CLASS')
4069  FORMAT(3X,'==========================================')
4070  FORMAT(3X,'AVERAGE PROPERTY TAX PAID IN EACH CLASS')
4071  FORMAT(3X,'==========================================')
4072  FORMAT(3X,'GROSS')
 4073  FORMAT(3X,'INCOME',20X,'PROPERTY CLASSES')
 4074  FORMAT(3X,'CLASS',2X,10F10.0)
4075   FORMAT(3X,'  TOTAL',10(F10.1))
4076   FORMAT(85X,'RUN NUMBER',F4.0)
C
```

TAB1 CONTINUED

```
C
 4010  CONTINUE
       WRITE(IPOUT,4059) DT,D1,D2
       WRITE(IPOUT,4076) RN
       WRITE(IPOUT,4061)
       WRITE(IPOUT,4062)
       WRITE(IPOUT,4063)
       WRITE(IPOUT,4061)
C
C
       GOTO4025
 4011  CONTINUE
       WRITE(IPOUT,4059) DT,D1,D2
       WRITE(IPOUT,4061)
       WRITE(IPOUT,4064)
       WRITE(IPOUT,4067)
       WRITE(IPOUT,4061)
C
       GOTO4025
 4012 CONTINUE
       WRITE(IPOUT,4059) DT,D1,D2
       WRITE(IPOUT,4061)
       WRITE(IPOUT,4068)
       WRITE(IPOUT,4069)
       WRITE(IPOUT,4061)
C
       GOTO4025
 4013 CONTINUE
       WRITE(IPOUT,4059) DT,D1,D2
       WRITE(IPOUT,4061)
       WRITE(IPOUT,4070)
       WRITE(IPOUT,4071)
C
 4025  CONTINUE
       IB=K2/10
       IB=IB+1
       IF(K2.EQ.20) IB=2
       IF(K2.LE.10) IB=1
       IP=0
       IX=0
C
C
C
       DO4090IJ=1,IB
       IX=IX+1
       IY=1+IP
       IP=10*IX
       IF(IP.GE.K2)IP=K2
       IK=IY
       WRITE(IPOUT,4072)
```

```
TAB1    CONTINUED

        WRITE(IPOUT,4073)
        WRITE(IPOUT,4074),(PKLAS(JP),JP=IK,IP)
        WRITE(IPOUT,4065)
        WRITE(IPOUT,4061)
C
C
C
        IF(IT.LE.1)GOTO4015
        IF(IT.LE.2)GOTO4016
        IF(IT.LE.3)GOTO4017
        IF(IT.LE.4)GOTO4018
C
 4015   CONTINUE
C
C
C
        DO4080I=1,K1
C
C
 4081   WRITE(IPOUT,4066),XK(I),(SN1(I,JP),JP=IK,IP)
 4080   CONTINUE
        WRITE(IPOUT,4061)
        WRITE(IPOUT,4075) (SN1(K1+1,JP),JP=IK,IP)
        WRITE(IPOUT,4060)
        GOTO4079
 4016   CONTINUE
        DO4082I=1,K1
 4083   WRITE(IPOUT,4066),XK(I),(STOT(I,JP),JP=IK,IP)
 4082   CONTINUE
        WRITE(IPOUT,4061)
        WRITE(IPOUT,4075) (STOT(K1+1,JP),JP=IK,IP)
        WRITE(IPOUT,4060)
        GOTO4079
 4017   CONTINUE
        DO4084I=1,K1
        DO4085JP=IK,IP
        IF(SN1(I,JP).EQ.0)GOTO4091
        STB(I,JP)=STOT(I,JP)/SN1(I,JP)
        GOTO4085
 4091   CONTINUE
        STB(I,JP)=0
 4085   CONTINUE
        WRITE(IPOUT,4066),XK(I),(STB(I,JP),JP=IK,IP)
 4084   CONTINUE
        WRITE(IPOUT,4060)
C
        GOTO4079
 4018   CONTINUE
        DO4086I=1,K1
        DO4087JP=IK,IP
```

```
TAB1    CONTINUED


         IF(SN1(I,JP).EQ.Ø)GOTO4Ø92
         STB(I,JP)=SPROP(I,JP)/SN1(I,JP)
         GOTO4Ø87
 4Ø92  CONTINUE
         STB(I,JP)=Ø
 4Ø87  CONTINUE
       WRITE(IPOUT,4Ø66),XK(I),(STB(I,JP),JP=IK,IP)
 4Ø86  CONTINUE
         WRITE(IPOUT,4Ø6Ø)
C
C
 4Ø79  CONTINUE
 4Ø9Ø CONTINUE
4Ø5Ø    CONTINUE
         RETURN
         END
.
```

```
NTAB2


         SUBROUTINE TAB2
         COMMON/SKL/SM(3Ø,25),SOTAX(3Ø,3Ø),SNTAX(3Ø,3Ø),
     $SCDO(3Ø,3Ø),SCDN(3Ø,3Ø),SN1(3Ø,3Ø),
     $ STOT(3Ø,3Ø),SPROP(3Ø,3Ø)
         COMMON/ST/STXO(3Ø,3Ø),STXN(3Ø,3Ø)
         COMMON/K/K1,K2,K3,K4,K5,N1
         COMMON/PROP/PKLAS(25),TP(25)
         COMMON/KLAS/XK(3Ø),TXK(3Ø)
         COMMON/DATE/ D1,D2,DT,RN
C
C
C
         IPOUT=6
         DIMENSION STB(3Ø,3Ø)
         DO4Ø5Ø IT=1,5
         IF(IT.LE.1)GOTO4Ø1Ø
         IF(IT.LE.2)GOTO4Ø11
         IF(IT.LE.3)GOTO4Ø12
         IF(IT.LE.4)GOTO4Ø13
         IF(IT.LE.5)GOTO4Ø14
C
C
 4Ø59    FORMAT(85X,'DATE OF RUN:',1X,A5,I2,',',1X,I4)
```

NTAB2 CONTINUED

```
 4060     FORMAT(1H1)
 4061   FORMAT(1H-)
 4062   FORMAT(3X,'AVERAGE TAXES PAID,OLD TAX STRUCTURE')
4063   FORMAT(3X,' ==========================================')
 4064   FORMAT(3X,'AVERAGE TAXES PAID,NEW TAX STRUCTURE')
4065   FORMAT(11(3X,7H-------))
 4066   FORMAT(3X,F7.0,10(F10.1))
 4067   FORMAT(3X,'=========================================')
4068    FORMAT(3X,'AVERAGE DISPOSABLE INCOME')
4069   FORMAT(3X,'==========================================')
4070     FORMAT(3X,'DISPOSABLE INCOME AS % GROSS INCOME,AV.')
4071   FORMAT(3X,'==========================================')
4072   FORMAT(3X,'GROSS')
 4073   FORMAT(3X,'INCOME',20X,'PROPERTY CLASSES')
 4074   FORMAT(3X,'CLASS',2X,10F10.0)
 4075   FORMAT(3X,'AVERAGE PROPERTY TAX CREDIT, NEW STRUCTURE')
 4076   FORMAT(3X,'==========================================')
4077     FORMAT(85X,'RUN NUMBER',F4.0)
C
C
C
 4010   CONTINUE
        WRITE(IPOUT,4059) DT,D1,D2
        WRITE(IPOUT,4077) RN
        WRITE(IPOUT,4061)
        WRITE(IPOUT,4062)
        WRITE(IPOUT,4063)
        WRITE(IPOUT,4061)
C
C
        GOTO4025
 4011   CONTINUE
        WRITE(IPOUT,4059) DT,D1,D2
        WRITE(IPOUT,4061)
        WRITE(IPOUT,4064)
        WRITE(IPOUT,4067)
        WRITE(IPOUT,4061)
C
        GOTO4025
 4012 CONTINUE
        WRITE(IPOUT,4059) DT,D1,D2
        WRITE(IPOUT,4061)
        WRITE(IPOUT,4068)
        WRITE(IPOUT,4069)
        WRITE(IPOUT,4061)
C
        GOTO4025
 4013 CONTINUE
        WRITE(IPOUT,4059) DT,D1,D2
        WRITE(IPOUT,4061)
```

```
NTAB2  CONTINUED

       WRITE(IPOUT,4070)
       WRITE(IPOUT,4071)
       GOTO4025
 4014  CONTINUE
       WRITE(IPOUT,4059) DT,D1,D2
       WRITE(IPOUT,4061)
       WRITE(IPOUT,4075)
       WRITE(IPOUT,4076)
C
 4025  CONTINUE
       IB=K2/10
       IB=IB+1
       IF(K2.EQ.20) IB =2
       IF(K2.LE.10) IB=1
       IP=0
       IX=0
C
C
C
       DO4090IJ=1,IB
       IX=IX+1
       IY=1+IP
       IP=10*IX
       IF(IP.GE.K2)IP=K2
       IK=IY
       WRITE(IPOUT,4072)
       WRITE(IPOUT,4073)
       WRITE(IPOUT,4074),(PKLAS(JP),JP=IK,IP)
       WRITE(IPOUT,4065)
       WRITE(IPOUT,4061)
C
C
C
       IF(IT.LE.1)GOTO4015
       IF(IT.LE.2)GOTO4016
       IF(IT.LE.3)GOTO4017
       IF(IT.LE.4)GOTO4018
       IF(IT.LE.5)GOTO4019
C
 4015  CONTINUE
C
C
C
       DO4080I=1,K1
C
C
       DO4031JP=IK,IP
       IF(SN1(I,JP).EQ.0)GOTO4030
       STB(I,JP)=STX0(I,JP)/SN1(I,JP)
       GOTO4031
```

```
NTA32  CONTINUED


 4030    CONTINUE
         STB(I,JP)=0
 4031   CONTINUE
 4081   WRITE(IPOUT,4066),XK(I),(STB(I,JP),JP=IK,IP)
 4080   CONTINUE
         WRITE(IPOUT,4060)
         GOTO4079
 4016   CONTINUE
         DO4082I=1,K1
         DO4032JP=IK,IP
         IF(SN1(I,JP).EQ.0)GOTO4033
         STB(I,JP)=STXN(I,JP)/SN1(I,JP)
         GOTO4032
 4033   CONTINUE
         STB(I,JP)=0
 4032     CONTINUE
         WRITE(IPOUT,4066) XK(I),(STB(I,JP),JP=IK,IP)
 4082   CONTINUE
         WRITE(IPOUT,4060)
         GOTO4079
 4017   CONTINUE
         DO4084I=1,K1
         DO4085JP=IK,IP
         IF(SN1(I,JP).EQ.0)GOTO4091
         STB(I,JP)=STOT(I,JP)-STXN(I,JP)
         STB(I,JP)=STB(I,JP)/SN1(I,JP)
         GOTO4085
 4091    CONTINUE
         STB(I,JP)=0
 4085   CONTINUE
         WRITE(IPOUT,4066),XK(I),(STB(I,JP),JP=IK,IP)
 4084   CONTINUE
         WRITE(IPOUT,4060)
C
         GOTO4079
 4018   CONTINUE
         DO4086I=1,K1
         DO4087JP=IK,IP
         IF(SN1(I,JP).EQ.0)GOTO4092
         STB(I,JP)=STOT(I,JP)-STXN(I,JP)
         STB(I,JP)=(STB(I,JP)/STOT(I,JP))*100.
         GOTO4087
 4092   CONTINUE
         STB(I,JP)=0
 4087   CONTINUE
        WRITE(IPOUT,4066),XK(I),(STB(I,JP),JP=IK,IP)
 4086   CONTINUE
         WRITE(IPOUT,4060)
         GOTO4079
 4019    CONTINUE
```

NTAB2 CONTINUED

```
        DO 4093 I=1,K1
        DO4034JP=IK,IP
        IF(SN1(I,JP).EQ.0)GOTO4035
        STB(I,JP)=SCDN(I,JP)/SN1(I,JP)
        GOTO4034
 4035  STB(I,JP)=0
 4034  CONTINUE
        WRITE(IPOUT,4066),XK(I),(STB(I,JP),JP=IK,IP)
 4093  CONTINUE
        WRITE(IPOUT,4060)
C
C
 4079  CONTINUE
 4090 CONTINUE
 4050   CONTINUE
        RETURN
        END
```

:END

TAB3

```
        SUBROUTINE TAB3
         COMMON/SKL/SM(30,25),SOTAX(30,30),SNTAX(30,30),
     $SCDO(30,30),SCDN(30,30),SN1(30,30),
     $ STOT(30,30),SPROP(30,30)
        COMMON/ST/STXO(30,30),STXN(30,30)
        COMMON/K/K1,K2,K3,K4,K5,N1
        COMMON/PROP/PKLAS(25),IP(25)
        COMMON/KLAS/XK(30),TXK(30)
        COMMON/DATE/ D1,D2,DT,RN
C
C
C
        IPOUT=6
         DIMENSION STB(30,30)
        DO4050 IT=1,4
        IF(IT.LE.1)GOTO4010
        IF(IT.LE.2)GOTO4011
        IF(IT.LE.3)GOTO4012
        IF(IT.LE.4)GOTO4013
  4059  FORMAT(84X,'DATE OF RUN:',1X,A5,I2,',',1X,I4)
  4060  FORMAT(1H1)
  4061  FORMAT(1H-)
```

```
TAB3   CONTINUED

4062  FORMAT(3X,' TOT@L TAXES, NLD SXSTDL (EXBL.PROP.TAX  )')
4063  FORMAT(3X,' ==========================================')
4064  FORMAT(3X,'TOTAL TAXES, NEW SYSTEM (EXCL.PROP.TAX)')
4065  FORMAT(11(3X,7H-------))
 4066  FORMAT(3X,F7.Ø,10(F10.1))
 4067  FORMAT(3X,'==================================')
4068  FORMAT(3X,' TOTAL PROPERTY TAX CREDIT,OLD SYSTEM')
4069  FORMAT(3X,'==========================================')
4070  FORMAT(3X,' TOTAL PROPERTY TAX CREDIT, NEW SYSTEM') .
4061  FORMAT(3X,'==================================')
4072  FORMAT(3X,'GROSS'(
 4073  FORMAT(3X,'INCOME',20X,'PROPERTY CLASSES')
 4074  FORMAT(3X,'CLASS',2X,10F10.Ø)
4075   FORMAT(3X,'  TOTAL',10(F10.1))
4076    FORM@T(85X,'RUN NUMBER',F4.Ø)
C
C
 4010  CONTINUE
        WRITE(IPOUT,4059) DT,D1,D2
        WRITE(IPOUT,4076) RN
        WRITE(IPOUT,4061)
        WRITE(IPOUT,4062)
        WRITE(IPOUT,4063)
        WRITE(IPOUT,4061)
C
C
        GOTO4Ø25
 4011  CONTINUE
        WRITE(IPOUT,4059) DT,D1,D2
        WRHTE(IPOUT,4061)
        WRITE(IPOUT,4064)
        WRITE(IPOUT,4067)
        WRITE(IPOUT,4061)
C
        GOTO4Ø25
 4012 CONTINUE
        WRITE(IPOUT,4059) DT,D1,D2
        WRITE(IPOUT,4061)
        WRITE(IPOUT,4068)
        WRITE(IPOUT,4069)
        WRITE(IPOUT,4061)
C
        GOTO4Ø25
 4013 CONTINUE
        WRITE(IPOUT,4058( DT,D1,D2
          WRITE(IPOUT,4061)
-       WRITE(IPOUT,4070)
        WRITE(IPOUT,4071)
C
- 4025  CONTINUE
```

```
TAB3   CONTINUED


       IB=K2/10
        IB=IB+1
-      IF(K2.EQ.20) IB=2
       IF(K2.LE.10) IB=1
       IP=0
       IX=0
C
C
C
       DO4090IJ=1,IB
       IX=IX+1
       IY=1+IP
       IP=10*IX
       IF(IP.GE.K2)IP=K2
       IK=IY
        WRITE(IPOUT,4072)
-      WRITE(IPOUT,4073)
       WRITE(IPOUT,4074),(PKLAS(JP(,JP=IK,IP)
       WRITE(IPOUT,4065)
       WRITE(IPOUT,4061)
C
C
C
       HF(HT.LE.1)GOTO4015
-       IF(HT.LD.2)GOTO4016
       IF(IT.LE.3)GOTO4017
       IF(IT.LE.4)GOTO4018
C
 4015  CONTINUE
C
C
C
       DO4080I=1,K1
C
C
 4081  WRITE(IPOUT,4066(,XK(I),(STXO(I,JP),JP=IK,IP)
 4080  CONTINUE
        WRITE(IPOUT,4061)
        WRITE(IPOUT,4075) (STXO(K1+1,JP),JP=IK,IP)
        WRITE(IPOUT,4060)
        GOTO4079
 4016  CONTINUE
        DO4082I=1,K1
 4083  WRITE(IPOUT,4066),XK(I),(STXN(I,JP),JP=IK,IP)
 4082  CONTINUE
        WRITE(IPOUT,4061)
        WRITE(IPOUT,4075) (STXN(K1+1,JP),JP=IK,IP)
        WRITE(IPOUT,4060)
        GOTO4079
 4017  CONTINUE
```

TAB3 CONTINUED

```
      DO4084I=1,K1
      WRITE(IPOUT,4066),XK(I),(SCDO(I,JP),JP=IK,IP)
 4084 CONTINUE
      WRITE(IPOUT,4061)
      WRITE(IPOUT,4075) (SCDO(J0+1,JP),JP=IK,IP)
      WRITE(IPOUT,4060)
C
      GOTO4079
 4018 CONTINUE
      DO4086H=1,K1
      WRITE(IPOUT,4066),XK(I),(SCDN(I,JP),JP=IJ,IP)
 4086 CONTINUE
      WRITE(IPOUT,4061)
      WRITE(IPOUT,4075) (SCDN(K1+1,JP),JP=IK,IP)
      WRITE(IPOUT,4060)
C
C
 4079 CONTINUE
 4090 CONTINUE
4050  CONTINUE
      RETURN
      END
```

TAB4

```
      SUBROUTINE TAB4
      COMMON/SKL/SM(30,25),SOTAX(30,30),SNTAX(30,30),
     $SCDO(30,30),SCDN(30,30),SN1(30,30),
     $ STOT(30,30),SPROP(30,30)
      COMMON/ST/STXO(30,30),STXN(30,30)
      COMMON/K/K1,K2,K3,K4,K5,N1
      COMMON/PROP/PKLAS(25),IP(25)
      COMMON/KLAS/XK(30),TXK(30)
      COMMON/DATE/ D1,D2,DT,RN
      COMMON/FAM/ MSTA,CH1,CH2
      COMMON/SUM/SUMS(25)
      COMMON/DIVCD/ ODIV(30),SDIV(30),XNDIV(30)
C
C
C
      IPOUT=6
      DIMENSION STB(30,30)
```

TAB4 CONTINUED

```
        DO4050 IT=1,4
        IF(IT.LE.1)GOTO4010
        IF(IT.LE.2)GOTO4011
        IF(IT.LE.3)GOTO4012
        IF(IT.LE.4)GOTO4013
 4059  FORMAT(85X,'DATE OF RUN:',1X,A5,I2,',',1X,I4)
 4060  FORMAT(1H1)
 4061  FORMAT(1H-)
4062   FORMAT(3X,'SUMMARY TAX DEDUCTION DATA')
4063   FORMAT(3X,6(5H=====))
4064   FORMAT(3X,'INCOME        TOTAL           DEDUCTIONS
     $     MEDICAL         DONATIONS')
4065   FORMAT(3X,'CLASS          INCOME              #
     $     RECEIPTS           #')
4066   FORMAT(1X,F8.0,4F15.2)
4067   FORMAT(3X,8H--------,2X,4(5X,8H--------,2X))
4068   FORMAT(3X,'INCOME        PERSONAL        EST. EXEMP      EST.EXEMP
     $     AV.EXEMP')
C
4069   FORMAT(3X,'CLASS          EXEMP. NEW       OLD              NEW
     $')
4070   FORMAT(3X,'INCOME         NO.OF CH-N      NO.OF CH-N
     $     NO. OF          NO.OF')
4071   FORMAT(3X,'CLASS            UNDER 16        OVER 16         TAXFILERS
     $     SINGLES')
4072   FORMAT(3X,'INCOME      TOTAL CRED      AV. CRED        TOTAL CRED
     $     AV.CRED')
4073   FORMAT(3X,'CLASS       OLD             OLD             NEW
     $    NEW')
4074   FORMAT(3X,'SUMMARY TAX EXEMPTION DATA')
4075   FORMAT(3X,'SUMMARY DEPENDENCY DATA')
4076   FORMAT(3X,'SUMMARY TAX CREDIT DATA')
4077    FORMAT(85X,'RUN NUMBER',F4.0)
C
C
 4010  CONTINUE
        WRITE(IPOUT,4059) DT,D1,D2
        WRITE(IPOUT,4077) RN
        WRITE(IPOUT,4061)
        WRITE(IPOUT,4062)
        WRITE(IPOUT,4063)
        WRITE(IPOUT,4061)
        WRITE(IPOUT,4064)
        WRITE(IPOUT,4065)
        WRITE(IPOUT,4067)
        WRITE(IPOUT,4061)
C
C
        GOTO4025
 4011  CONTINUE
```

TAB4 CONTINUED

```
      WRITE(IPOUT,4059) DT,D1,D2
      WRITE(IPOUT,4061)
      WRITE(IPOUT,4074)
      WRITE(IPOUT,4063)
      WRITE(IPOUT,4061)
      WRITE(IPOUT,4068)
      WRITE(IPOUT,4069)
      WRITE(IPOUT,4067)
      WRITE(IPOUT,4061)
C
      GOTO4025
 4012 CONTINUE
      WRITE(IPOUT,4059) DT,D1,D2
      WRITE(IPOUT,4061)
      WRITE(IPOUT,4075)
      WRITE(IPOUT,4063)
      WRITE(IPOUT,4061)
      WRITE(IPOUT,4070)
      WRITE(IPOUT,4071)
      WRITE(IPOUT,4067)
      WRITE(IPOUT,4061)
C
      GOTO4025
 4013 CONTINUE
      WRITE(IPOUT,4059) DT,D1,D2
      WRITE(IPOUT,4061)
      WRITE(IPOUT,4076)
      WRITE(IPOUT,4063)
      WRITE(IPOUT,4072)
      WRITE(IPOUT,4073)
      WRITE(IPOUT,4067)
      WRITE(IPOUT,4061)
C
 4025 CONTINUE
C
C
C
      IF(IT.LE.1)GOTO4015
      IF(IT.LE.2)GOTO4016
      IF(IT.LE.3)GOTO4017
      IF(IT.LE.4)GOTO4018
C
 4015 CONTINUE
C
      X=0
C
C
      DO4030I=1,K1
C
C
```

TAB4 CONTINUED

```
4081    WRITE(IPOUT,4066),XK(I),(SM(I,J),J=1,4)
 4080   CONTINUE
        WRITE(IPOUT,4061)
        WRITE(IPOUT,4066),X,(SUMS(J),J=1,4)
        WRITE(IPOUT,4060)
        GOTO4079
 4016   CONTINUE
        DO4082I=1,K1
        IF(SM(I,21).LE.0) GO TO 4096
        STB(I,1)=SM(I,7)/SM(I,21)
        GO TO 4097
4096    STB(I,1)=0
4097    CONTINUE
 4083   WRITE(IPOUT,4066),XK(I),SM(I,5),SM(I,7),SM(I,6),STB(I,1)
 4082   CONTINUE
        WRITE(IPOUT,4061)
        WRITE(IPOUT,4066),X,SUMS(5),SUMS(7),SUMS(6)
        WRITE(IPOUT,4060)
        GOTO4079
 4017   CONTINUE
        DO4084I=1,K1
        WRITE(IPOUT,4066),XK(I),SM(I,22),SM(I,23),SM(I,21),SM(I,24)
 4084   CONTINUE
        WRITE(IPOUT,4061)
        WRITE(IPOUT,4066),X,SUMS(22),SUMS(23),SUMS(21)
        WRITE(IPOUT,4060)
C
        GOTO4079
 4018   CONTINUE
        DO4086I=1,K1
        IF(SM(I,21).LE.0)GOTO4092
        STB(I,2)=SM(I,17)/SM(I,21)
        STB(I,3)=SM(I,18)/SM(I,21)
        GOTO4087
 4092   CONTINUE
        STB(I,3)=0
        STB(I,2)=0
 4087   CONTINUE
        WRITE(IPOUT,4066),XK(I),SM(I,17),STB(I,2),SM(I,18),STB(I,3)
 4086   CONTINUE
        WRITE(IPOUT,4066) X,SUMS(17),X,SUMS(18),X
        WRITE(IPOUT,4060)
C
C
 4079   CONTINUE
 4090 CONTINUE
4050    CONTINUE
        RETURN
        END
```

TAB5

```
      SUBROUTINE TAB5
      COMMON/SKL/SM(30,25),SOTAX(30,30),SNTAX(30,30),
     $SCDO(30,30),SCDN(30,30),SN1(30,30),
     $ STOT(30,30),SPROP(30,30)
      COMMON/ST/STXO(30,30),STXN(30,30)
      BNMMON/K/K1,K2,K3,K4,K5,N1
      COMMON/PROP/PKLAS(25),TP(25)
      COMMON/KLAS/XK(30),TXK(30)
      COMMON/DATE/ D1,D2,DT,RN
      COMMON/FAM/ MSTA,CH1,CH2
      COMMON/SUM/SUMS(25)
      COMMON/DIVCD/ ODIV(30),SDIV(30),XNDIV(30)
C
C
C
      IPOUT=6
      DIMENSION STB(30,30)
      DO4050 IT=1,4
      IF(IT.LE.1)GOTO4010
      IF(IT.LE.2)GOTO4011
      IF(IT.LE.3)GOTO4012
      IF(IT.LE.4)GOTO4013
 4059 FORMAT(85X,'DATE OF RUN:',1X,A5,I2,',',1X,I4)
 4060 FORMAT(1H1)
 4061 FORMAT(1H-)
4062  FORMAT(3X,'SUMMARY TAX DATA')
4063  FORMAT(3X,6(5H=====))
4064   FORMAT(3X,'INCOME          TAXES          TAXES
     $          TAXES          TAXES')
4065   FORMAT(3X,'CLASS           TOTAL,OLD
     $AV.,OLD        TOTAL,NEW      AV.,NEW')
4066  FORMAT(1X,F8.0,4F15.2)
4067  FORMAT(3X,8H--------,2X,4(5X,8H--------,2X))
4068   FORMAT(3X,'INCOME          CREDIT %
     $CREDIT %       CREDIT %       CREDIT %')
C
4069   FORMAT(3X,'CLASS         GR.INC         TAXES
     $          GR.INC         TAXES')
4077   FORMAT(3X,'                (OLD)          (OLD)
     $          (NEW)          (NEW)')
4078  FORMAT(3X,'     (TAXES EXCLUDE EFFECT OF CREDIT)')
4070  FORMAT(3X,'INCOME          TAXES %        TAXES %
     $        TAXES %        TAXES %')
4071   FORMAT(3X,'CLASS           GR.INC         GR.INC
     $         GR.INC         GR.INC')
4072   FORMAT(3X,'                                LS.CRED.
     $                    LS.CRED.')
4074  FORMAT(3X,'INCIDENCE OF PROPERTY TAX CREDIT')
4075  FORMAT(3X,'INCIDENCE OF TAXES')
4000  FORMAT(3X,'DIVIDENDS')
```

```
TAB5   CONTINUED


5001    FORMAT(3X,'INCOME        TOTAL           OLD DIV
     $     NEW DIV')
5002   FORMAT(3X,'CLASS            DIVIDENDS
     $     CREDIT           CREDIT')
5003   FORMAT(85X,'RUN NUMBER',F4.0)
C
 4010  CONTINUE
       WRITE(IPOUT,4059) DT,D1,D2
       WRITE(IPOUT,5003) RN
       WRITE(IPOUT,4061)
       WRITE(IPOUT,4062)
       WRITE(IPOUT,4063)
       WRITE(IPOUT,4061)
       WRITE(IPOUT,4064)
       WRITE(IPOUT,4065)
       WRITE(IPOUT,4067)
       WRITE(IPOUT,4078)
       WRITE(IPOUT,4061)
C
C
       GOTO4025
 4011  CONTINUE
       WRITE(IPOUT,4059) DT,D1,D2
       WRITE(IPOUT,4061)
       WRITE(IPOUT,4074)
       WRITE(IPOUT,4063)
       WRITE(IPOUT,4061)
       WRITE(IPOUT,4068)
       WRITE(IPOUT,4069)
       WRITE(IPOUT,4077)
       WRITE(IPOUT,4067)
       WRITE(IPOUT,4078)
       WRITE(IPOUT,4061)
C
       GOTO4025
 4012 CONTINUE
       WRITE(IPOUT,4059) DT,D1,D2
       WRITE(IPOUT,4061)
       WRITE(IPOUT,4075)
       WRITE(IPOUT,4063)
       WRITE(IPOUT,4061)
       WRITE(IPOUT,4070)
       WRITE(IPOUT,4071)
       WRITE(IPOUT,4072)
       WRITE(IPOUT,4077)
       WRITE(IPOUT,4067)
       WRITE(IPOUT,4061)
C
       GOTO4025
 4013 CONTINUE
```

```
TAB5   CONTINUED

       WRITE(IPOUT,4059) DT,D1,D2
       WRITE(IPOUT,4061)
       WRITE(IPOUT,5000)
       WRITE(IPOUT,4063)
       WRITE(IPOUT,4061)
       WRITE(IPOUT,5001)
       WRITE(IPOUT,5002)
       WRITE(IPOUT,4067)
       WRITE(IPOUT,4061)
C
 4025  CONTINUE
C
C
C
       IF(IT.LE.1)GOTO4015
       IF(IT.LE.2)GOTO4016
       IF(IT.LE.3)GOTO4017
       IF(IT.LE.4)GOTO4018
C
 4015  CONTINUE
C
       X=0
C
C
       DO4080I=1,K1
       IF(SM(I,21).LE.0)GO TO 4040
       STB(I,1)=SM(I,15)/SM(I,21)
       STB(I,2)=SM(I,16)/SM(I,21)
       GOTO 4041
4040   STB(I,1)=0
       STB(I,2)=0
4041   CONTINUE
C
C
4081   WRITE(IPOUT,4066),XK(I),SM(I,15),STB(I,1),SM(I,16),STB(I,2)
 4080  CONTINUE
       WRITE(IPOUT,4061)
       WRITE(IPOUT,4066),SUMS(15),X,SUMS(16),X
       WRITE(IPOUT,4060)
       GOTO4079
 4016  CONTINUE
       DO4082I=1,K1
       IF(SM(I,1).LE.0) GO TO 4096
       STB(I,3)=SM(I,17)/SM(I,1)
       STB(I,4)=SM(I,18)/SM(I,1)
       GO TO 4043
4096   STB(I,3)=0
       STB(I,4)=0
4043   CONTINUE
       IF(SM(I,15).LE.0)GO TO 4044
```

```
TAB5   CONTINUED


        STB(I,5)=SM(I,17)/SM(I,15)
        GO TO4Ø45
4Ø44   STB(I,5)=Ø
4Ø45    CONTINUE
        IF(SM(I,16).LE.Ø) GO TO 4Ø46
        STB(I,6)=SM(I,18)/SM(I,16)
        GO TO 4Ø97
4Ø47   CONTINUE
4Ø46   STB(I,6)=Ø
4Ø97   CONTINUE
 4Ø83  WRITE(IPOUT,4Ø66),XK(I),STB(I,3),STB(I,5),STB(I,4),STB(I,6)
 4Ø82  CONTINUE
        WRITE(IPOUT,4Ø61)
        WRITE(IPOUT,4Ø6Ø)
        GOTO4Ø79
 4Ø17  CONTINUE
        DO4Ø84I=1,KI
        IF(SM(I,1).LE.Ø) GO TO4Ø48
        STB(I,7)=SM(I,15)/SM(I,1)
        STB(I,8)=(SM(I,15)-SM(I,17))/SM(I,1)
        STB(I,9)=SM(I,16)/SM(I,1)
        STB(I,10)=(SM(I,16)-SM(I,18))/SM(I,1)
        GO TO 4Ø49
4Ø48    STB(I,7)=Ø
        STB(I,8)=Ø
        STB(I,9)=Ø
        STB(I,10)=Ø
4Ø49   CONTINUE
        WRITE(IPOUT,4Ø66),XK(I),STB(I,7),STB(I,8),STB(I,9),STB(I,10)
 4Ø84  CONTINUE
        WRITE(IPOUT,4Ø6Ø)
C
        GOTO4Ø79
 4Ø18  CONTINUE
        DO4Ø86I=1,KI
       WRITE(IPOUT,4Ø66),XK(I),SDIV(I),ODIV(I),XNDIV(I)
 4Ø86  CONTINUE
        WRITE(IPOUT,4Ø6Ø)
C
C
 4Ø79  CONTINUE
 4Ø9Ø CONTINUE
4Ø5Ø    CONTINUE
        RETURN
        END
```

Appendix G

GUELPH MATCHING PROGRAM

Harry Newton

November 1, 1971

The following pages present a description of the above-mentioned program, including the assumptions made and the steps taken in writing the program, and the problems encountered in testing the program.

I. Introduction to the Matching Programs

1. This program takes the property tax records of the residents of Guelph and tries to match them with their personal income tax records.

2. The only pieces of information that are common to both the property tax tapes and the personal income tax tapes are names and addresses. The names and addresses appear in full on the property tax records, but on the personal income tax records, only the first ten letters of the surname and the first five letters of the given name appear. Hence, the sole criteria for a match are the names and the addresses.

3. A certain match is defined as a property tax record and a personal income tax record with

   i) identical surnames (first ten letters),

   ii) identical addresses (house no. and street name),

   and iii) the given name on the personal income tax record is identical to one of the given names on the property tax record (first five letters).

4. A doubtful or possible match is defined as a property tax record and a personal income tax record with

   i) identical surnames,

   ii) identical addresses, and

   iii) different given names.

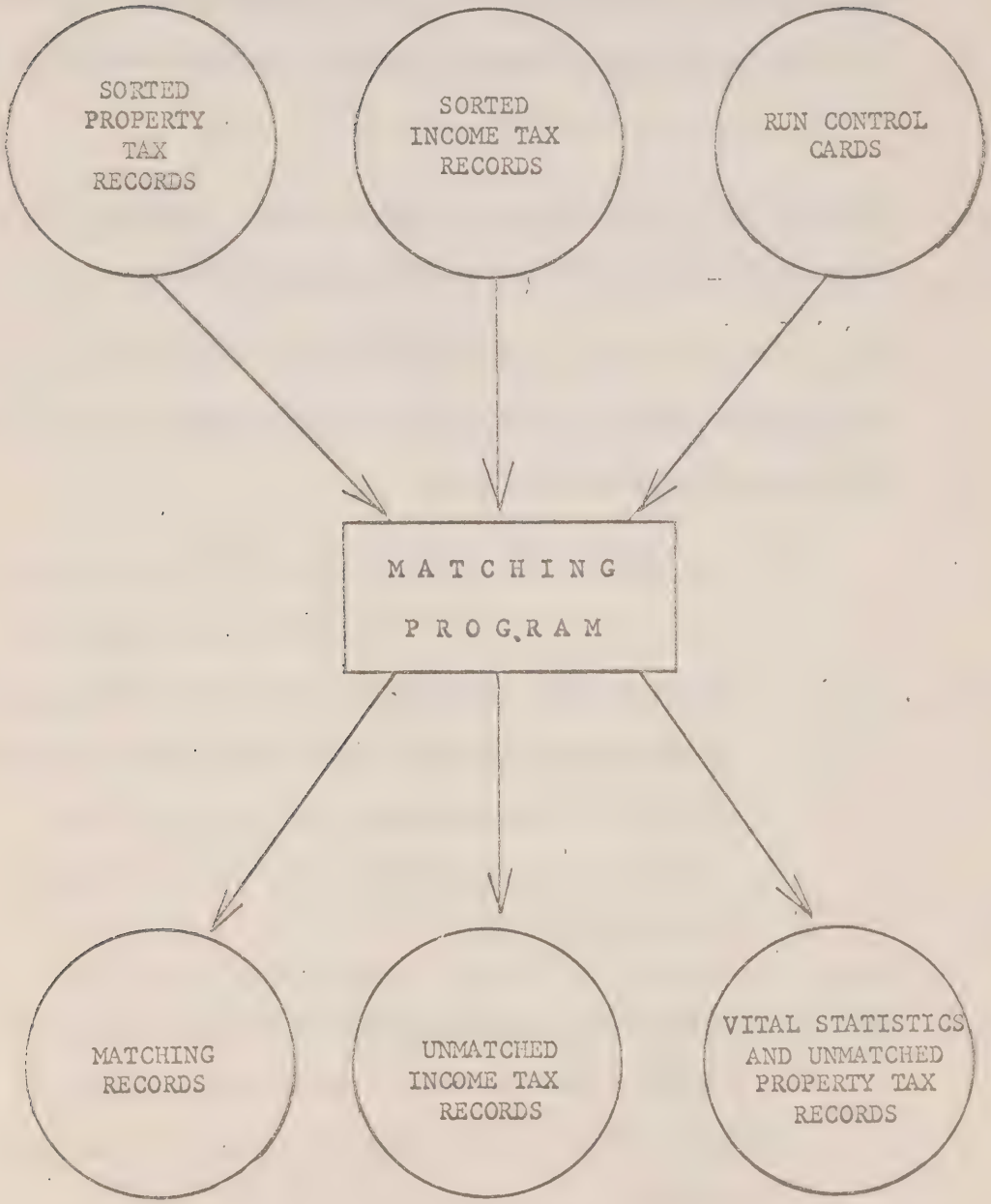
5. Doubtful matches are important for the following reasons:

   i) the possibility that the husband is the only income taxfiler in the family, but the property is in the wife's name, or vice versa.

   ii) the possibility that more than one (or more than two) members of the family are income taxfilers. For instance, a husband and wife, both whom are listed on the property tax record, may both be income taxfilers. In addition, other members of the family, who are not listed on the property tax record, may also file income tax returns. In this case, doubtful matches will be useful to the user who is trying to calculate total income of a particular family. Also, the user may wish to compare the incomes of the various members of the family.

6. Given the above definitions, one can now set to devise an algorithmic procedure to search for these matches.

General Flowchart of the Program



II. Preparation of Input Tapes

1. The property tax records were sorted alphabetically by the surname and then by the given name of the first assessed person on the record.

2. The personal income tax records were sorted alphabetically by the surname and then by the given name of the taxfiler.

3. In preparing an input tape of property tax records for the program, the following changes were made to the data tapes supplied by the Department of Municipal Affairs.

   i) The name of the last ten assessed persons on each record were deleted. Generally, this space was blank anyway. The names of the first five assessed persons were retained but only the first two names are used in the program.

   ii) All of the data pertaining to property dimensions was deleted.

NOTE: The above two steps permitted the property tax record to be shortened considerably (from 645 characters to 265 characters). The subsequent saving of tape space is obvious.

   iii) Each record was lengthened by 11 characters to 276 characters by adding eight blanks at the end of the record.

iv) Only property tax records pertaining to non-vacant residential properties were retained. Those pertaining to other categories were deleted.

v) A key was placed at the beginning of the record to indicate whether the assessed person(s) owned (O) ore rented (R) the property.

4. In preparing an input tape of personal income tax records for the program, the following changes were made to the data tapes supplied by the Department of Revenue.

i) Each record was lengthened by nine characters (from 315) to 324 characters by addining nine blanks at the end of the record.

ii) No further changes.

5. All of the steps mentioned above were performed on the IBM 360/40 which was resident at the Computer Services Centre (hereafter referred to as CSC) until October 1, 1971.

6. As of October 1, 1971, it was necessary to convert both input tapes (property tax and personal income tax) for use on the UNIVAC 1108 at CSC. The conversion program created two tapes with the following characteristics:

i) COBOL format

ii) 9 - track

iii) Standard labels

iv) Property tax tape - blocking factor - 10
- 46 words per record

v) Personal income tax tape - blocking factor - 50
- 54 words per record

NOTE: Since each word contains six characters, one can see why both records had to be lenthened:

6 X 46 = 276
6 X 54 = 324

7. The COBOL formatted tapes were created in Fortran-callable, COBOL File Handler subroutine, ØGFIØC. This subroutine is part of the system library at CSC, and a description of how to use it is available from CSC or from anyone who has used it.

III. The Program Itself

1. Input - the two tapes described in Part II. There are approximately 15,000 property tax records and 28,000 income tax records.

2. The Matching Procedure - Basically, the program takes a property record and tries to find an income tax record with identical names and addresses. More specifically, the program reads in a property tax record and then an income tax record. If the surname on the income tax record precedes (alphabetically) the surname on the property tax record, then it is assumed that there will be no match for this income tax record. Income tax records are read in until the surname on the income tax record is identical or exceeds the surname on the property tax record. In this case, the income tax record is stored. If the surnames are identical, addresses are compared. If addresses match, then given names are compared. Doubtful and certain matches are written on tape. If the surname on the income tax record exceeds the surname on the property tax record, another property tax record is read in. Now, records that were stored earlier in the program are compared and the same comparison criteria as above are applied to the records. After the stored records are exhausted, more income tax records are read from the input tape. Whenever, the surname on an income tax record precedes the surname on the property tax record, the income tax record is deleted from storage. All income tax records that cannot be matched are written on tape. The entire procedure continues until one of the tapes reaches an end of file.

3. The above description is by no means a thorough description of the matching procedure but is merely an attempt to outline the important steps in the program.

4. Output = from the line printer.

   a) "vital statistics" (i.e. no. of records read, no. of records written)

   b) all unmatched property tax records.

5. Output - on tape. All certain and doubtful matches are written on one tape. They are coded so as to be distinguishable. Also, on a second tape, all unmatched personal income tax records are written.

6. The output tapes created on the UNIVAC 1108 can be adapted to the PDP-10 (Dataline) with minimal problems. Both tapes were created using the I/Ø routine NTRAN, which is available in the system library of both machines.

7. Both output tapes possess the following characteristics:

   i) written by NTRAN

   ii) 7 - track

   iii) unlabelled

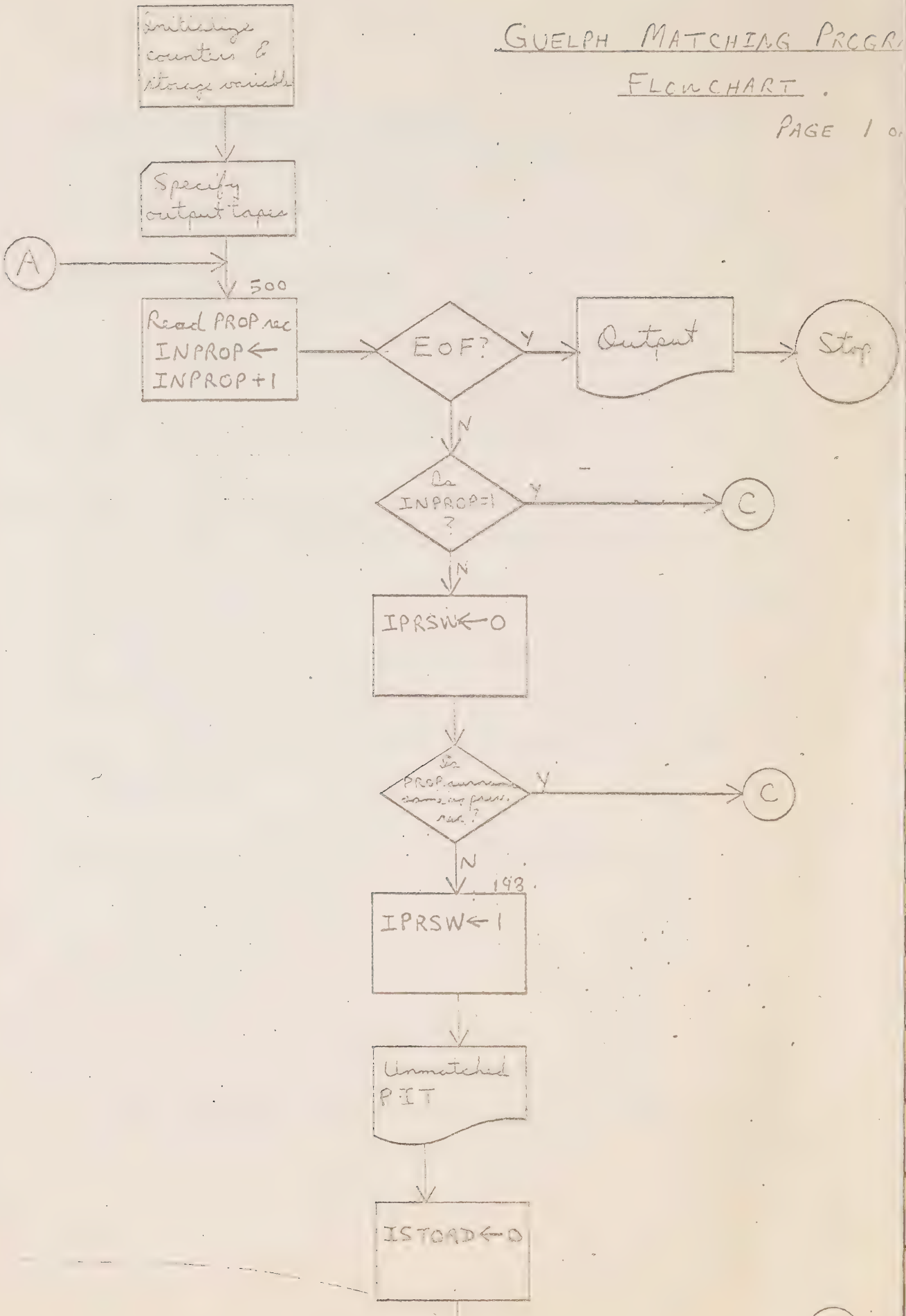
   iv) blocking factor - 10

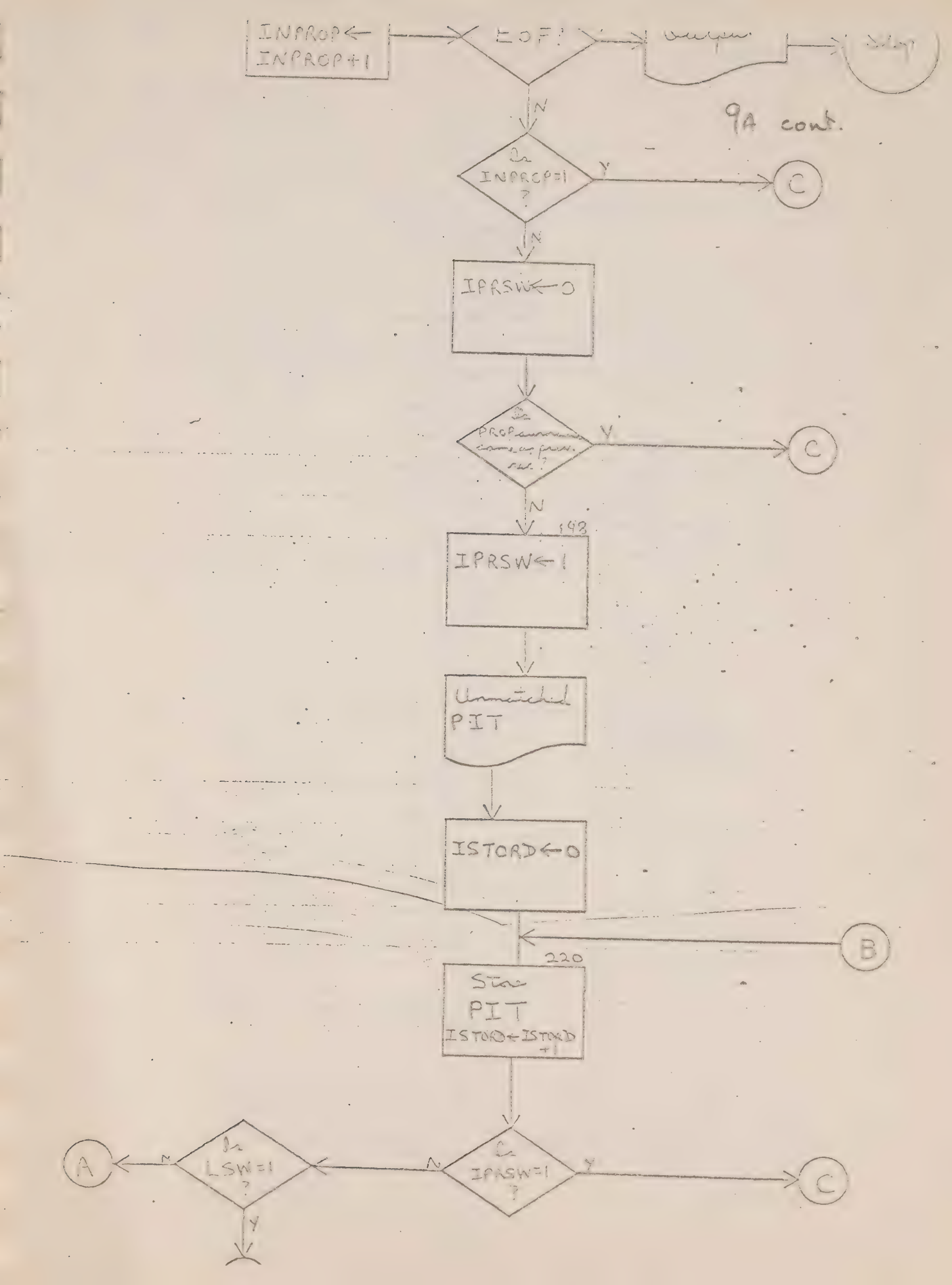
   v) Matched record is 208 words long.

   vi) Unmatched income tax record is 87 words long.

GUELPH MATCHING PROGR

FLOWCHART .

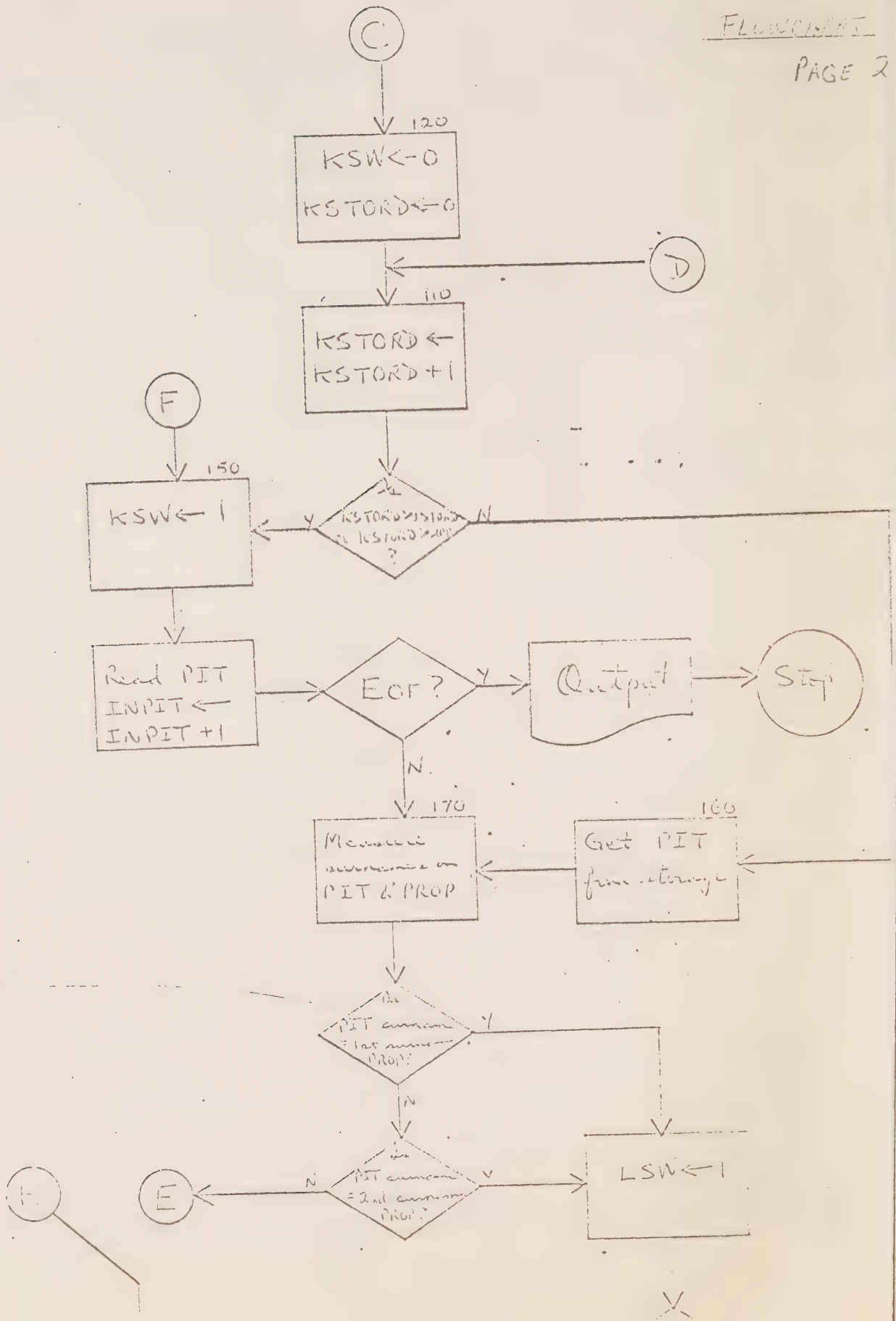



INPROP←
INPROP+1
EOF?
9A cont.
N
Is
INPROP=1
?
Y
C
N
IPRSW←0
Is
PROP
Y
C
N
193
IPRSW←1
Unmatched
PIT
ISTORD←0
B
220
Store
PIT
ISTORD←ISTORD
+1
Is
IPASW=1
?
N
Y
C
Is
LSW=1
?
N
A
Y

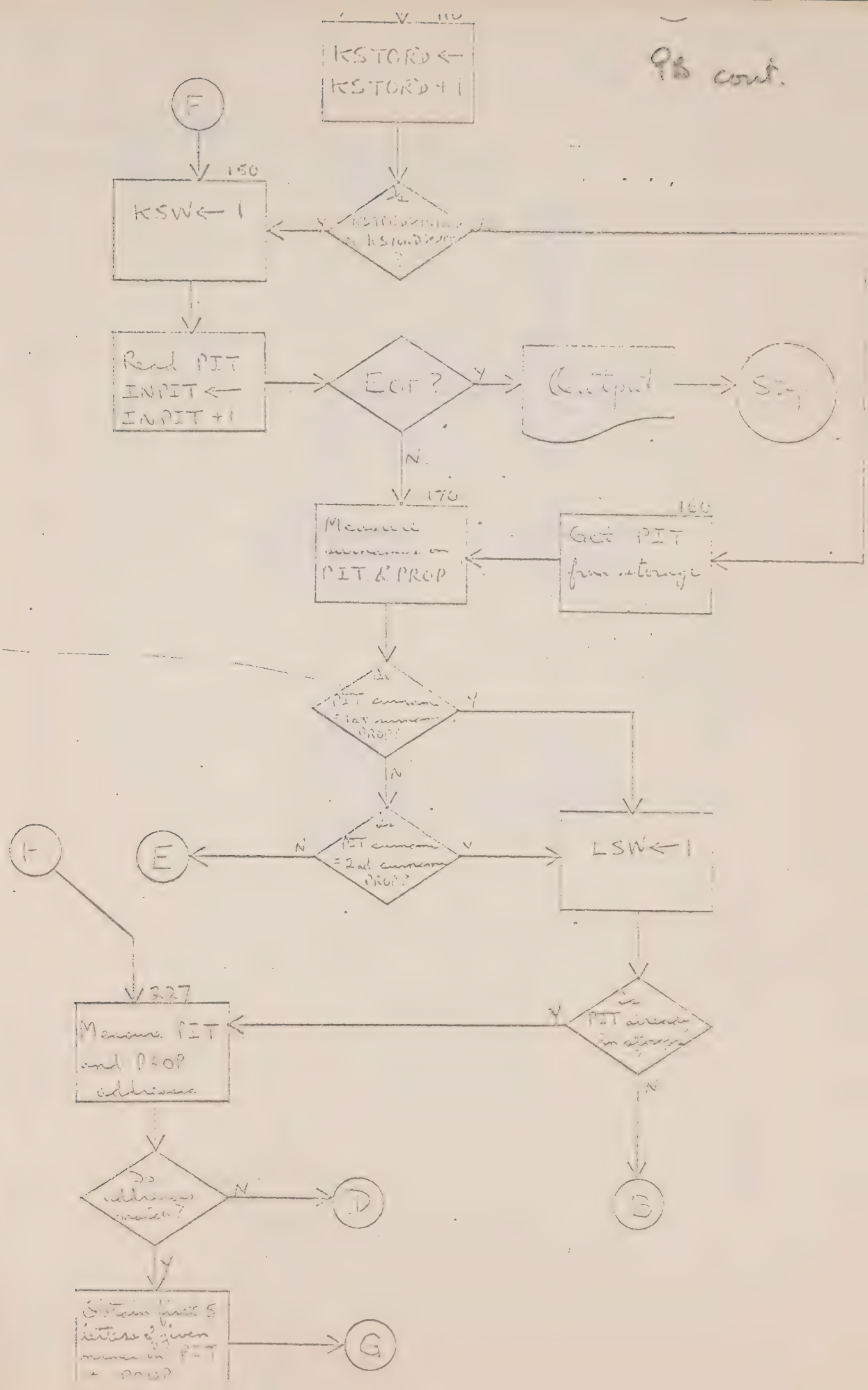
GUELPH MATCHING PROG

FLOWCHART

PAGE 2



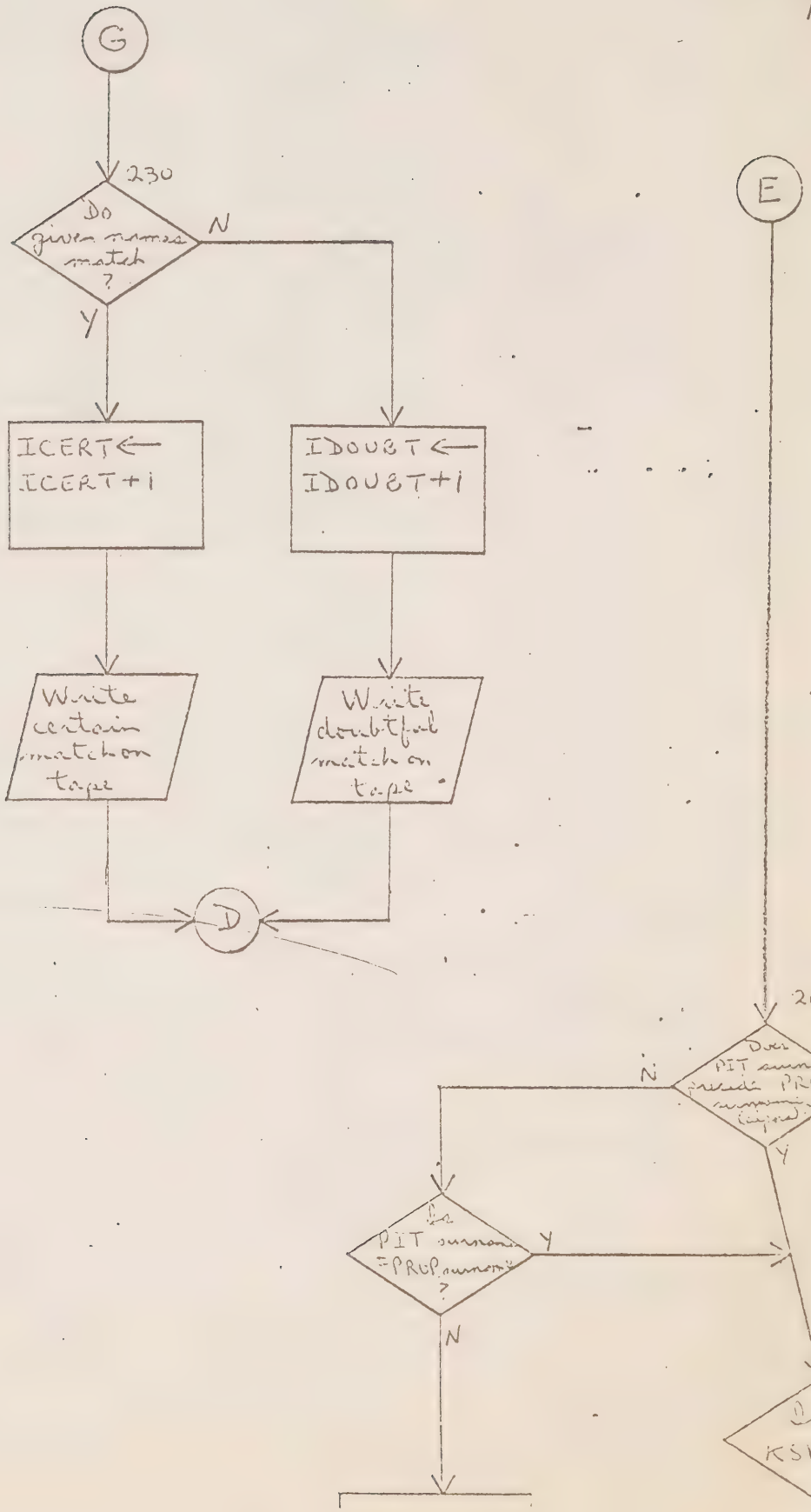
9B cont.



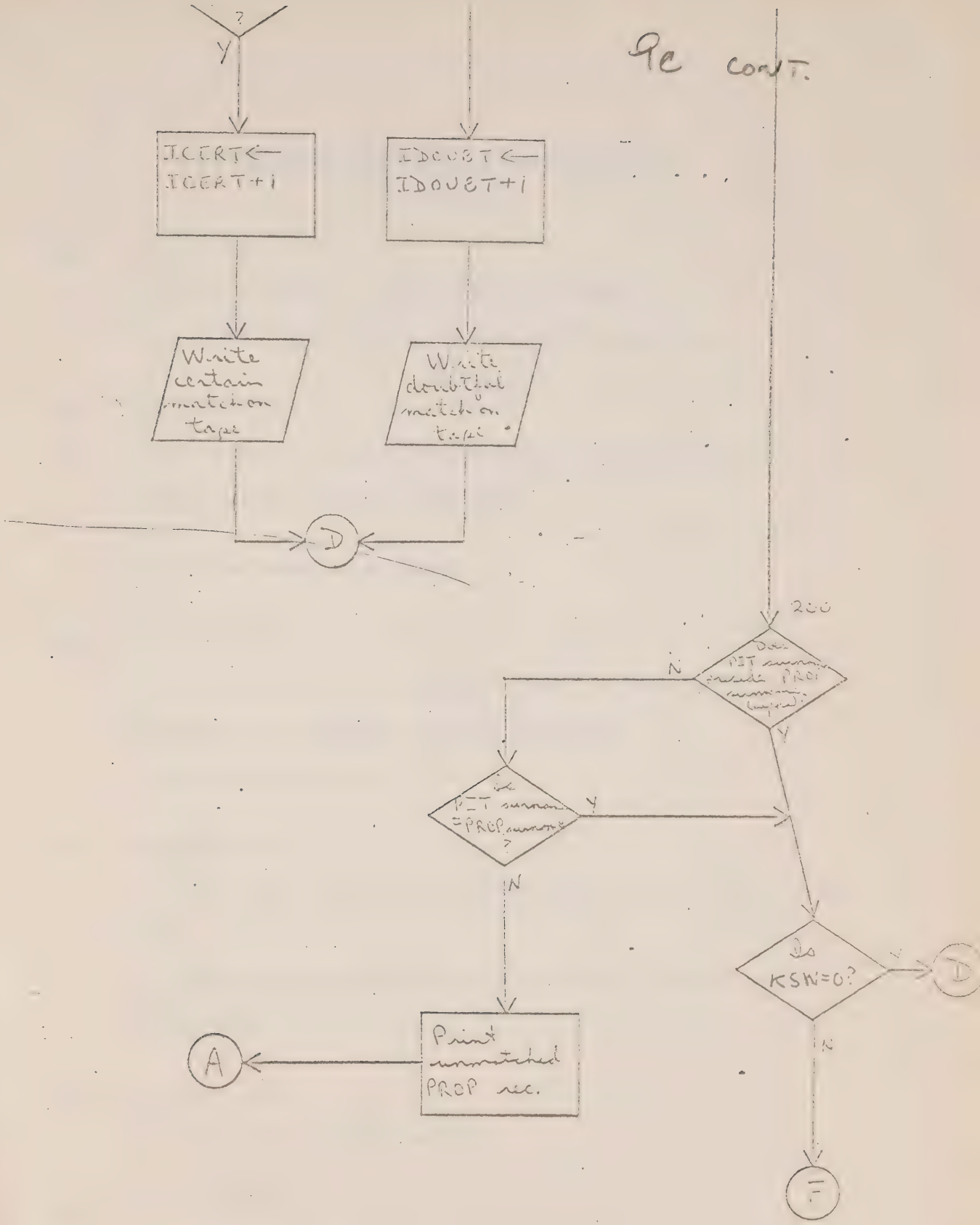
KSTORD ← KSTORD + 1
F
150
KSW ← 1
Read PIT
INPIT ← INPIT + 1
EOF?
Y
Output
Stop
N
170
Measure surname on PIT & PROP
160
Get PIT from storage
Is PIT surname = 1st surname PROP?
Y
N
Is PIT surname = 2nd surname PROP?
N
E
Y
LSW ← 1
F
227
Measure PIT and PROP addresses
Is PIT already in storage?
Y
N
B
Do addresses match?
N
D
Y
Obtain first 5 letters of given names in PIT + PROP
G

GUELPH MATCHING PROGR

FLOWCHART



9c CONT.


?
Y
ICERT ← ICERT+1
IDOUBT ← IDOUBT+1
Write certain match on tape
Write doubtful match on tape
D
200
Does PIT surname preside PROP surname (type)?
N
Y
Is PIT surname = PROP surname ?
Y
N
Is KSW=0?
Y
D
N
Print unmatched PROP rec.
A
F

Description of Important Variables and Flags In the Program

KSW has the value

0 when a PIT record is to be read from storage.

1 when a PIT record is to be read from the input tape.

LSW has the value

0 when the surname on the PIT record does not match the surname on the property tax record.

1 when these surnames do match.

IPRSW has the value

0 when the surname on the property record is the same as the surname on the previous property tax record.

1 when these surnames are different.

MSW has the value

'0' for the first match of a PIT record with a property tax record, and

'1' for any subsequent match of a PIT record with the same property tax record.

LCEE has the value

'C' and indicates a certain match.

LDEE has the value

'D' and indicates a doubtful or possible match.

MSTATJ has the value

'1' when the name on the PIT record matches the first name on the property tax record.

'2' when the name on the PIT record matches the second name on the property tax record.

ISTØRD is the number of records currently in storage.

KSTORD is a pointer indicating the record that is being read from storage.

INPROP is the number of property tax records that have been read from the input tape.

INPIT is the number of PIT records that have been read from the input tape.

ICERT is the number of certain matches that have been found.

IDOUBT is the number of doubtful matches that have been found.

LERR has the value

0 until end of file on the PIT input tape is reached, and

1 when end of file is reached.

KERR has the value

0 until end of file on the property tax input tape is reached, and

1 when end of file is reached.

V. Description of Output Record

1. KEY #1 - The first word in the output record indicates whether the matches is a certain or a doubtful match. It is coded C or D respectively.

2. KEY #2 - The second word contains the label 0 (Zero) if this is the first match of a personal income tax record and the property tax record, or 1 if this is a subsequent match of a different personal income tax record with the same property tax record.

3. KEY #3 - The third word contains the label 1 if the name on the personal income tax record matches the first surname on the property tax record, or 2 if the name on the personal income tax record matches the second surname on the property tax record.

4. KEY #4 - The fourth word indicates whether the property is owned or rented by the person(s) mentioned on the property tax record. It is coded Ø or R respectively. This piece of data is not too reliable since the record selection procedure used by the programmers in the preparation of the input tape may have underestimated the number of properties rented. This does not affect the matching procedure in any way.

5. Words 5 - 121 are property tax record data.

6. Words 122 - 208 are income tax record data.

7. The following is a breakdown of the components of a matching record. The output vector is called MATCH, and has 208 components.

GUELPH MATCHED RECORDS

DESCRIPTION OF OUTPUT RECORD

		Format	Position on Original Tape	Variable Name	Description
MATCH (1)	1	A1	--		Key #1
2	1	A1	--		Key #2
3	1	A1	--		Key #3
4	1	A1	--		Key #4
5	2	I2	1-2		County
6	2	I2	3-4		Municipality
7	2	I2	5-6		Ward
8	4	I4	7-10		Area
9	5	I5	11-15		Roll #
10	4	I4	16-19		Tenant #
11	1	A1	20		PERFY
12	1	A1	21		RCE
13	1	A1	22		SUPPORT
14	1	A1	23		CORP
15	2	I2	24-25		High School
16	2	I2	26-27		Public School
17	2	I2	28-29		Separate School
18	4	A4	30-33	PKLAS	Property Class
19	1	I1	34		Special Area Rates #1

MATCH	20	1	I1	35	Special Area Rates #2
	21	1	I1	36	" " " #3
	22	1	I1	37	" " " #4
	23	1	I1	38	" " " #5
	24	1	I1	39	" " " #6
	25	8	I8	40-47	Occupied Land
	26	8	I8	48-55	Occupied Building
	27	3	I3	56-58	Business %
	28	8	I8	59-66	Pre-Co. Business $
	29-33	5	5A1	67-71	House #
	34-57	24	24A1	72-95	Street Name
	58-65	29	7A4,A1	96-124	Short Form Description
	66-93	28	28A1	125-152	Name of Assessed Person #1
	94-121	28	28A1	153-180	Name of Assessed Person #2
	122	7	I7	1-7 LØC	1969 Locator #
	123	6	I6	8-13 IYØB	Birthdate
			3X	14-16	Unused
	124	2	I2	17-18	Province
	125	2	I2	19-20	Always 69
	126	4	I4	21-24	Calendar date of assessment
	127	1	I1	25	Assessing category code
	128	1	I1	26	T67A Action Code
	129	1	I1	27 SAM	Sample Code
	130	1	I1	28	Marital status
			2X	29-30	Unused

MATCH 131	6	I6	31-36	XLØS ✓	Prior year loss
132	4	I4	37-40	XINC ✓	Gross income from man's source $'000
133	10	I10	41-50	SFØR	Foreign income
134	10	I10	51-60	XDIV	Net dividends ✗
135-6	10	19,A1	61-70	XTØT ✓	Total income*
137	10	I10	71-80	DED ✓	Total deductions
138	6	I6	81-86	XMD ✓	Medical gross
139-42	4	4A1	87-90		First 4 char of spouse's nam
143	10	I10	91-100	DØN ✓	Gross donations
144-5	10	19,A1	101-110	EXEMP ✓	Personal exemptions*
146	10	I10	111-120	TAXI	Taxable income
147-8	10	19,A1	121-130	FTAX	Net federal tax*
149-50	10	I9,A1	131-140	PTAX	Net provincial tax*
151	10	I10	141-150	FFØR	Foreign tax paid
152	10	I10	151-160	FFTX	Foreign tax credit- Fed.port
153	10	I10	161-170	PFTX	Foreign tax credit- Prov. "
154	10	I10	171-180	STAX	Tax deducted per T4
155	10	I10	181-190	TADJ	Tax adjustments
156	10	I10	191-200	PAID	Payment received on filing
157-8	10	19,A1	201-210		Taxpayers balance*
159-60	10	19,A1	211-220	CMBAL	Computer calculated balance*
161-170	10	10A1	221-230	SUR	Surname
171	9	I9	231-239	SINNØ	Social Insurance No.
172	1	I1	240		Sex code
173	5	I5	241-245		Locality code

MATCH					
174-78	5	5A1	246-250	FNAME	First name
179-208	30	30A1	251-280	ADD	Street Address

---

* For these six variables, the last location for each variable is overpunched to indicate the sign (+ or -). After conversion of these variables (use subroutine NUMCØM), the entire variable will be stored in the underlined location.

VI. Limitations of the Program

Visual examination of tape dumps of the two input tapes reveals that in a very small number of cases, the program did not match records which should have been matched:

1. First, consider the case of a property tax record containing two different surnames, say JONES AND SMITH. This record will be sorted among the property records starting with the letter J. The program may be able to find an income tax which will match JONES, but will not look for an income tax record which will match SMITH. To search for an income tax record for SMITH at this point would require excessive C.P.U. time and core. Hence, anytime that a property tax record contains two different surnames, it is unlikely that the program will search for an income tax record which matches the second surname.

2. Second, names and addresses may be misspelled or misread by those persons who prepare the data. The following are examples:
   i) Missing punctuation: O'BRIEN may be lacking its apostrophe.
   ii) Names that are not pronounced in English the way they are spelled: certain European names.
   iii) Names that can be spelled many ways: SHEPHERD, SHEPHARD, SHEPPARD, etc.
   iv) Errors in addresses
   v) A name like MACDONALD may appear as two words, i.e. MAC DONALD.

3. This program does not have the capacity to determine whether a name is spelled correctly. Hence, any match involving misprinted input data which may be obvious to the human eye is rejected immediately by the computer.

If the user should wish to try to obtain more matches by visual means, the print out of the unmatched property tax records and the tape dump of the unmatched income tax records are available for this purpose.

This program is not a general matching program. It was written to handle specific data under specific conditions. Hence, anyone wishing to design a program to perform a matching procedure should take note of the specialized nature of this program.

Reading in the Matched Records

Input records are read from the input tape ten at a time. However, the user will want to analyze each record individually. Hence, the following statements will serve as a suggested means of doing this:

```
      CØMMØN  etc.
      DATA NRIN/0/, IEND/0/ etc.
        |
        |
   20 CALL READTP
      DØ 100 I = 1, 10
      CALL ATTACH (I)
        |
        |
      Insert FØRTAN statements which
      analyze each record
        |
        |
  100 CONTINUE
      IF (IEND.NE.I) GØ TØ 20
        |
        |
      Program continues on end-of-file
        |
        |
      STØP
      END
```

Subroutine READIN performs the following operations each time it is called.

i) checks for end-of-file

ii) reads in a block of ten records

iii) checks for unreadable records

iv) increments record counter by 10

v) converts overpunched characters to numeric form (calls NUMCØN)

iv) returns to calling program.

GUELPH MATCHING PROGRAM - NEW OUTPUT TAPE

The output tapes from the Guelph Matching Program are not completely readable at Dataline. All numeric data can be read on the PDP-10, but literal data cannot be read. In other words, all data pertaining to money can be read, but information such as names and addresses cannot be read. Hence, a new tape has been created on the UNIVAC 1108 using NTRAN. This tape contains only certain matches, and possess the following characteristics:

i) 7-track

ii) unlabelled

iii) blocking factor - 10

iv) record length - 208 words

v) MATCH (1) = 1 (not 'C') for all records

vi) MATCH (2) = 1 instead of '0'
or 2 instead of '1'

vii) MATCH (3) = 1 instead of '1'
or 2 instead of '2'

viii) MATCH (4) = 1 instead of 'Ø'
or 2 instead of 'R'

ix) MATCH (18)= 1 instead of 'RBSU'
or 2 instead of 'FBSU'
or 3 for all other property classes.

x) All overpunched characters have been converted using subroutine NUMCØN.

NOTE: Please refer to the description of the output record in the documentation to the program.

Subroutine ATTACH with argument I attaches program variable names to the appropriate elements of the ith record of the input block of records. The program variable names are contained in CØMMØN statements. This subroutine is readily alterable according to the data requirements of the user.

****

Program file READTP contains the three subroutines READIN, ATTACH, and NUMCØN.

The following items are still unreadable on the PDP-10.

MATCH (11) - MATCH (14)

MATCH (29) - MATCH (121)

MATCH (139) - MATCH (142)

MATCH (161) - MATCH (170)

MATCH (174) - MATCH (208)

However, it is not expected that they will enter into the analysis.

The user is reminded that the overpunched characters appearing in the income tax section of the output record have already been converted. Hence subroutine NUMCØN will not be called by READIN.

Harry Newton

November 17, 1971

Appendix H

NUMERIC CONVERSION

Helmut Giese

September 21, 1971

This is a sub-routine in the Guelph Analyzer which converts a Cobol formatted sign to a Fortran integer.

FUNCTION NUMCON (NUM, ID, NREC, INREC, IPRINT)

This function converts a cobol sign formatted number and converts it to a Fortran integer.

Input: NUM is the integer portion of the number (in 10's)

ID is the sign-carrying digit (making it an alphabetic character)

NREC is the record number on which NUM and ID are located

INREC is a counter to aid in the location on the record of an ID - field containing a character not recognized for conversion

IPRINT is the logical unit number on which error messages are are written.

Note: 1) Any one or all if NREC, INREC, IPRINT maybe set to zero to leave out part of the identification of an ID - field containing an unrecognizable character.

If IPRINT = 0 , no error message is given.

2) If ID contains a character not recognized in the conversion, then

2.1 NUMCON = + 10 * NUM

2.2 A message is written on Unit# IPRINT.

3) Characters recognized for conversion are

3.1 - the digits 0 to 9

3.2 - the letters A to R

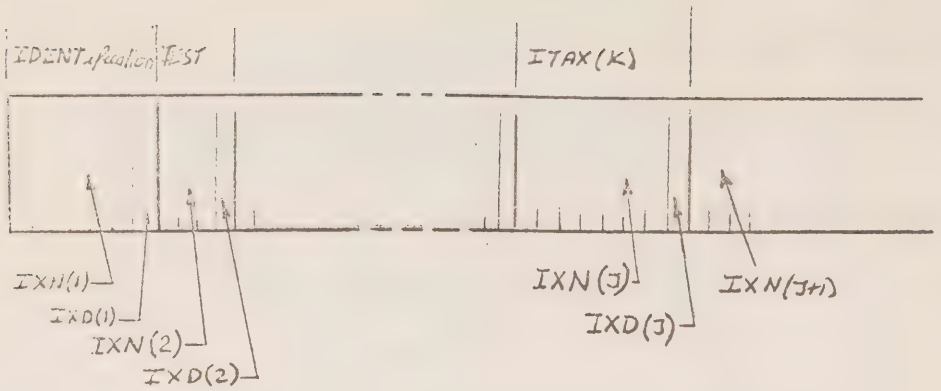
3.3 - blanks, and the fields 12-0 and 11-0

SEP. 2 1 1971

COMPILATION ON UNIVAC 1106

```
[illegible]PILED BY 1201 00STE ON [illegible] SEP 71 AT 1[illegible]:1[illegible]:1[illegible].

NUMCON        ENTRY POINT 000[illegible]7

[illegible]ED: CODE(1) 000163; DATA(0) 000104; BLANK COMMON(2) 000000

[illegible]EFERENCES (BLOCK, NAME)

[illegible]

[illegible]SIGNMENT  (BLOCK, TYPE, RELATIVE LOCATION, NAME)

000044 1F          0001    000005 114G        0001    000023 125G        0001    000046 14
00111 1[illegible]G       0001    000120 300L        0000 I 000042 IADD        0000 I 000040 IB
00067 INUPS        0000 I 000001 IT           0000 I 000025 ITN         0000 I 000037 IS
[illegible] NUMCON


      CLABEL NUMCON  (FOR  NUMBER-CONVERSION)          H.GIESE     SEPT/71          NUMCO
      C                                                                             NUMCO
            FUNCTION NUMCON(NUM,ID,NREC,INREC,IPRINT)                               NUMCO
      C                                                                             NUMCO
      C     THIS FUNCTION CONVERTS THE COBOL FORMATTED SIGNED NUMERIC FIELDS        NUMCO
      C     AND PULLS OUT THE SIGN CARRIED BY THE ZONE PORTION OF THE LAST          NUMCO
      C     [illegible]                                                             NUMCO
      C DEFINITIONS: NUM      NUMERIC PART OF NUMBER IN 10THS.                      NUMCO
      C              ID       SIGNED (OVERPUNCHED) UNITS PART OF NUMBER.            NUMCO
      C              NREC     INPUT RECORD NUMBER.                                  NUMCO
      C              INREC    ORDINAL NUMBER OF FIELD IN RECORD.                    NUMCO
      C              IPRINT   PRINTER LOGICAL UNIT NUMBER.                          NUMCO
      C-NOT: IT(1) AND IT(11) ARE 12-0 AND 11-0 PUNCHES RESPECTIVELY
      C                                                                             NUMCO
            DIMENSION IT(20),ITN(10)                                                NUMCO
            DATA ITN/1H0,1H1,1H2,1H3,1H4,1H5,1H6,1H7,1H8,1H9/                       NUMCO

                                  000025   600505 050505          0000
                                  000026   610505 050505          0000
                                  000027   620505 050505          0000
                                  000030   630505 050505          0000
                                  000031   640505 050505          0000
                                  000032   650505 050505          0000
                                  000033   660505 050505          0000
                                  000034   670505 050505          0000
                                  000035   700505 050505          0000
                                  000036   710505 050505          0000
            [illegible]/1H[illegible],1HA,1HB,1HC,1HD,1HE,1HF,1HG,1HH,1HI,                    NUMCO
                  1H[illegible],1HU,1HK,1HL,1HM,1HN,1HO,1HP,1HQ,1HR/,IBL/1H /              NUMCO
```

eg 3



IDENT = NUMCON(IXN(1), IXD(1), NREC, 1, 6)

if IPRINT = 6,

ITAX(K) = NUMCON(IXN(J), IXD(J), NREC, J, IPRINT)

SEP. 2 1 1971

```
                                000032   7404 00 00 0 000120 0001
                                000033   2417 01 00 0 000001
      [illegible] CONTINUE
      [illegible]
                                000034   7004 04 00 0 000023 0001
                                000035   1017 02 00 0 000012
      IADD = 0
                                000036   0100 02 00 0 000041 0000
      IF(ID.EQ.IBL) GO TO 300
                                000037   0500 00 00 0 000042 0000
                                000040   1000 00 00 0 000040 0000
                                000041   1500 00 00 0 000000 7775
                                000042   5100 00 00 0 000014
                                000043   7404 00 00 0 000120 0001
                                000044   2717 01 00 0 000001
                                000045   2317 04 00 0 000011
      DO 105 J=1,10
      IADD =J-1
                                000046   0600 01 00 0 000043 0000          1416
                                000047   1017 00 00 0 000001
                                000050   1500 00 00 0 000043 0000
      IF(ID.EQ.ITN(J)) GO TO 300
                                000051   0200 00 00 0 000042 0000
                                000052   1000 02 01 0 000024 0000
                                000053   1500 02 00 0 000000 7775
                                000054   5100 00 00 0 000016
                                000055   7404 00 00 0 000120 0001
                                000056   2417 01 00 0 000001
  105 CONTINUE
      IADD =0
                                000057   7004 04 00 0 000046 0001
      IF(IPRINT.NE.0) WRITE (IPRINT,1) INREC,ID,ID,NREC,IT,ITN
                                000060   0500 00 00 0 000042 0000
                                000061   5100 00 00 0 000074 0000
                                000062   7404 00 00 0 000120 0001
                                000063   7413 13 00 0 000000 0003
                                000064   0000 00 01 0 000074 0000
                                000065   0000 00 00 0 000044 0000
                                000066   0000 03 12 0 000071 0000
                                000067   1017 00 00 0 000075 0000
                                000070   7201 01 00 0 000000 0004
                                000071   1017 00 00 0 000000 7775
                                000072   7201 01 00 0 000000 0004
                                000073   1017 00 00 0 000000 7775
                                000074   7201 01 00 0 000000 0004
                                000075   1017 00 00 0 000076 0000
                                000076   7201 01 00 0 000000 0004
                                000077   1017 16 00 0 000001
                                000100   2317 04 00 0 000023
                                000101   0100 16 00 0 000037 0000          1606
                                000102   2700 01 00 0 000037 0000
                                000103   1017 00 01 0 000000 0000
                                000104   7201 01 00 0 000000 0004
                                000105   1417 16 00 0 000001
                                000106   7004 04 00 0 000101 0001
                                000107   1017 16 00 0 000001
                                000110   2317 04 00 0 000011
```

```
                    000001   540505 050505          0000
                    000002   060505 050505          0000
                    000003   070505 050505          0000
                    000004   100505 050505          0000
                    000005   110505 050505          0000
                    000006   120505 050505          0000
                    000007   130505 050505          0000
                    000010   140505 050505          0000
                    000011   150505 050505          0000
                    000012   160505 050505          0000
                    000013   550505 050505          0000
                    000014   170505 050505          0000
                    000015   200505 050505          0000
                    000016   210505 050505          0000
                    000017   220505 050505          0000
                    000020   230505 050505          0000
                    000021   240505 050505          0000
                    000022   250505 050505          0000
                    000023   260505 050505          0000
                    000024   270505 050505          0000
                    000040   050505 050505          0000
      IMULT=10
                    000000   1017 00 00 0 000012
      IADD = 0
                    000001   0100 00 00 0 000041 0000
                    000002   0500 00 00 0 000042 0000
                    000003   2717 01 00 0 000001
                    000004   2317 04 00 0 000011
      [illegible] J=1,10
      [illegible]
                    000005   0600 01 00 0 000043 0000
                    000006   1017 00 00 0 000001
                    000007   1500 00 00 0 000043 0000
      IF(ID.EQ.IT(J))  GO TO 300
                    000010   0200 00 00 0 000042 0000
                    000011   1000 02 01 0 000000 0000
                    000012   1500 02 00 0 000000 7775
                    000013   5100 00 00 0 000016
                    000014   7404 00 00 0 000120 0001
                    000015   2417 01 00 0 000001
      [illegible]
      IMULT=-10
                    000016   7004 04 00 0 000005 0001
                    000017   1017 02 00 3 177765
                    000020   0100 02 00 0 000041 0000
                    000021   2717 01 00 0 000001
                    000022   2317 04 00 0 000011
      DO [illegible] J=1,10
      [illegible]
                    000023   0600 01 00 0 000043 0000
                    000024   1017 00 00 0 000001
                    000025   1500 00 00 0 000043 0000
      IF(ID.EQ.IT(J+10)) GO TO 300
                    000026   0100 00 00 0 000042 0000
                    000027   1000 02 01 0 000012 0000
                    000030   1500 02 00 0 000000 7775
                    000031   5100 00 00 0 000016
```

```
                                000111   0100 16 00 0 000037 0000          164G
                                000112   2700 01 00 0 000037 0000
                                000113   1017 00 01 0 000024 0000
                                000114   7201 01 00 0 000000 0004
                                000115   1417 16 00 0 000001
                                000116   7004 04 00 0 000111 0001
                                000117   7200 00 00 0 000000 0005
39*       300 NUMCON=IMULT*NUM+IADD
                                000120   1000 00 00 0 000041 0000          300L
                                000121   3100 00 00 0 000077 0000
                                000122   1400 00 00 0 000042 0000
40*           RETURN
41*     C
                                000123   0100 00 00 0 000000 0000
                                000124   2300 03 00 0 000126 0001
                                000125   7404 00 00 0 000127 0001
                                000126   0000 07 11 0 000071 0000
                                000127   2700 13 00 0 000072 0000          BEXI
                                000130   7113 16 00 0 000100 0000
                                000131   2700 01 00 0 000102 0000
                                000132   2300 04 00 0 000103 0000
                                000133   1000 00 00 0 000000 0000
                                000134   5015 00 00 1 000067 0000
                                000135   7404 00 00 1 000067 0000
                                000136   7404 00 00 0 000000 0006
                                000137   0601 13 00 0 000072 0000          NUMC(
                                000140   7112 16 00 0 000100 0000
                                000141   0600 01 00 0 000102 0000
                                000142   0400 04 00 0 000103 0000
                                000143   1000 01 13 1 000000
                                000144   0100 01 00 0 000077 0000
                                000145   1016 00 13 1 000001
                                000146   0101 00 00 0 000053 0001
                                000147   0101 00 00 0 000073 0001
                                000150   0101 00 00 0 000071 0001
                                000151   0101 00 00 0 000012 0001
                                000152   0101 00 00 0 000030 0001
                                000153   0101 00 00 0 000041 0001
                                000154   1000 01 13 1 000002
                                000155   0100 01 00 0 000076 0000
                                000156   1000 01 13 1 000003
                                000157   0100 01 00 0 000075 0000
                                000160   1000 01 13 1 000004
                                000161   0100 01 00 0 000074 0000
42*       1 FORMAT(/,' ID NOT IN CONVERT TABLE : Y(',I3,')= ',A1,'  INPUT RECO
43*        *RD #',I6,//10X,20A1,5X,10A1,' OR BLANK',/)
44*         END
                                000162   7404 00 00 0 000000 0001

ND OF COMPILATION:        NO  DIAGNOSTICS.
```

RUNID: ED1670 ACCOUNT: E-DEVP PROJECT: E-B0009A9

TIME: 00:00:01.854 IN: 47 OUT: 0 PAGES: 6 CR3

INITIATION TIME: 18:12:15-SEP 22,1971

TERMINATION TIME. 18:12:23-SEP 22,1971